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Final Environmental Impact Statement Wastewater Treatment Facilities/City of Norman, Cleveland County, Oklahoma

(U.S.) Environmental Protection Agency
Dallas, TX

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Region 6
1201 Elm Street
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April 1983

Water

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Environmental Impact Statement

Final

Wastewater Treatment Facilities/City of Norman, Cleveland County, Oklahoma

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16. ABSTRACT

The city of Norman is currently experiencing problems with wastewater treatment facilities it operates that serve the city and the University of Oklahoma. Alternatives to correct existing problems and accommodate expected flows to the year 2000 were analyzed As its preferred alternative, Norman proposes to upgrade the present treatment plant, to expand sludge facilities, to construct interceptor and collector sewers and to expand its service area. Principal impacts of Norman's preferred alternative would be: facilitation of the conversion of about 600 acres of environmentally significant agricultural lands; support of orderly growth; approximately a 3 percent increase in pollutant loadings to Lake Thunderbird; improved water quality in the Canadian River; reduction of odors and elimination of overflowswithin the collection system; and lifting of the hookup moratorium in the Bishop Creek area. Although planning included advanced treatment alternatives, the preferred decision of EPA and the Oklahoma State Department of Health (OSDH) is to approve and support construction of secondary treatment units while deferring advanced treatment decisions until water quality standards and wasteload allocations have been finalized. This is the most cost-effective way of achieving federal and state water quality goals. In order to protect Lake Thunderbird, EPA and OSDH may require mitigation measures as grant conditions.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1201 ELM STREET
DALLAS, TEXAS 75270

April 22, 1983

TO ALL INTERESTED AGENCIES, OFFICIALS, PUBLIC GROUPS AND INDIVIDUALS:

Enclosed is a copy of the Final Environmental Impact Statement (EIS) on the awarding of a grant under Section 201 of the Clean Water Act for construction of upgraded wastewater treatment facilities for the city of Norman, Cleveland County, Oklahoma. This EIS has been prepared in compliance with the National Environmental Policy Act of 1969 and implementing regulations.

Because changes from the Draft EIS are minor, this Final EIS incorporates the Draft EIS by reference and includes the following: 1) a revised and updated summary; 2) EPA's response to comments received on the Draft EIS; 3) revisions necessary to the Draft EIS; and 4) EPA's preferred action.

The Final EIS is being distributed to those who made comments on the Draft EIS and to those who requested a copy. The document is also available for public review at the following locations:

Norman City Clerk's Office
201 West Gray
Norman, Oklahoma

Pioneer Multi-County Library
205 North Webster
Norman, Oklahoma

Oklahoma State Department of Health
Water Facilities Engineering Service
Construction Grants Division
N.E. 10th and Stonewall
Oklahoma City, Oklahoma

U.S. Environmental Protection Agency
InterFirst Two Building
Twenty-Eighth Floor
1201 Elm Street
Dallas, Texas

Comments or inquiries on this EIS should be addressed to Mr. Clinton B. Spotts, Regional EIS Coordinator, at the above address by the date stamped on the cover sheet following this letter.

Sincerely yours,

for Spencer E. Phillips
Dick Whittington, P.E.
Regional Administrator

FINAL ENVIRONMENTAL IMPACT STATEMENT

WASTEWATER TREATMENT FACILITIES
NORMAN, OKLAHOMA

RESPONSIBLE AGENCY: U.S. Environmental Protection Agency, Region 6

ACTION BEING CONSIDERED: Awarding construction funds for wastewater treatment facilities to the city of Norman, Oklahoma.

CONTACT FOR FURTHER INFORMATION:
Clinton B. Spotts, Regional EIS Coordinator
U.S. Environmental Protection Agency, Region 6
1201 Elm Street
Dallas, Texas 75270
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ABSTRACT: The city of Norman operates sewage treatment works that serve the city and the University of Oklahoma. Major problems include: (a) the treatment facility is inefficient and cannot meet state and federal standards regarding effluent quality; (b) the existing collection system cannot accommodate existing flows; and (c) collection and treatment capacity is inadequate to accommodate the substantial growth projected to occur in the planning area. Alternatives regarding service area, collection system improvements, wastewater treatment and sludge management were analyzed to accommodate expected flows to the year 2000. As its preferred alternative, Norman proposes to expand its service area in conformance with the city's Comprehensive Plan and to upgrade the present treatment plant using bio-discs to provide secondary treatment; to expand sludge facilities for anaerobic digestion followed by a combination of wet-injection disposal and dewatering/stockpiling/land disposal; and to construct interceptor and collection sewers necessary to relieve current overloaded conditions and to accommodate projected sewage flows. Principal impacts of this alternative would be: facilitation of the conversion of about 600 acres of environmentally significant agricultural lands to urban land uses; support of orderly growth in compliance with the city's land use plan (COMPLAN); approximately a 3 percent increase in pollutant loadings to Lake Thunderbird, the city's main drinking water supply; improved water quality in the South Canadian River; reduction of odors and elimination of overflows within the collection system; and lifting of the hookup moratorium in the Bishop Creek area. Although planning included advanced treatment alternatives, the preferred decision of EPA and the Oklahoma State Department of Health (OSDH) is to approve and support construction of secondary treatment units while deferring advanced treatment decisions until water-quality standards and wasteload allocations have been finalized. This is the most cost-effective way of achieving federal and state water-quality goals, improving the quality of the Canadian River, and protecting prime agricultural lands. In order to protect Lake Thunderbird, EPA and OSDH may require mitigation measures as grant conditions; however, the matter requires local resolution, which EPA and OSDH encourage.

DATE COMMENTS DUE: JUN 20 1983

RESPONSIBLE OFFICIAL: for Frances E. Phillips
Dick Whittington, P.E.
Regional Administrator

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PREFACE

On July 16, 1982 the U.S. Environmental Protection Agency (EPA) filed a Draft Environmental Impact Statement (EPA 906/9-82-008) regarding wastewater treatment facilities in the city of Norman, Oklahoma. Notice of availability of the Draft EIS was published in the Federal Register on July 30, 1983. Since that time, EPA has received and reviewed public comments on the Draft EIS. EPA has delegated authority for review and approval of facilities plans, plans and specifications, and construction grants for wastewater treatment facilities under the Clean Water Act to the Oklahoma State Department of Health (OSDH). EPA and OSDH have determined their preferred course of action with regard to the funding of treatment facilities in Norman.

This document is the Final Environmental Impact Statement (Final EIS) on the awarding of design and construction grants for the proposed upgrading of wastewater treatment facilities in the city of Norman, Oklahoma. Since responses to comments received on the Draft EIS did not require significant changes in data or analyses, the Draft EIS was not reprinted in full. This Final EIS incorporates the Draft EIS by reference and identifies all written and oral comments received during public review, the responses to those comments, and additions and corrections to the Draft EIS resulting from public review. The Draft EIS and this Final EIS, together, constitute the complete Final Environmental Impact Statement.

The Final EIS contains four parts and three appendices. The four parts are: a summary which presents the major conclusions of the Draft and Final EIS (Part I); a listing of comments on the Draft EIS and responses to the major issues (Part II); revisions to the Draft EIS made in response to comments (Part III); and a discussion of the preferred alternatives identified by formal participants in the planning process (Part IV). A summary of responses to Public Hearing comments is presented in Part II. Comment letters received regarding the Draft EIS and appropriate responses are included in Appendix A. An evaluation of the public participation process is presented in Appendix B.

A copy of the Draft EIS is available for review at each of the depositories listed on page II-1. A limited number of copies of the Draft EIS are also available from the EPA Regional Office (see cover page for the appropriate contact).

Both the Draft EIS and Final EIS were prepared with the assistance of Lee Wilson and Associates, Inc. of Santa Fe, New Mexico. A list of persons with both EPA and LWA who were involved in the preparation of the two documents is presented in Draft EIS Chapter 8.

PART I. SUMMARY OF DRAFT AND FINAL EIS

A. EXISTING PROBLEMS

The city of Norman owns and operates wastewater collection and treatment facilities serving the city and the University of Oklahoma. The collection system includes lines and lift stations which are now severely overloaded, or which will be overloaded by the year 2000. Existing treatment is insufficient to meet state and federal standards. Sludge digesters are near capacity, and sludge disposal does not conform to EPA regulations. Alternatives to solve these problems must consider economic and engineering factors, uncertainties about future water quality criteria for the Canadian River, the need to minimize impacts to prime agricultural lands, and the need to minimize impacts of nonpoint-source pollution on Lake Thunderbird (the major water supply reservoir in the area) which may occur as a result of urbanization associated with sewer extensions. The alternatives must be in conformance with Norman's comprehensive land use plan (COMPLAN).

B. PROJECT ALTERNATIVES CONSIDERED BY APPLICANT

No Action. The alternative of taking no action has been rejected by the city because failure to address the problems cited in section A would cause: continued violation of federal effluent regulations and impairment of the Canadian River as a habitat and recreational resource; potential health and odor problems throughout the city; overloading of sludge facilities and associated odor and vector problems. The probable result, an expansion of the existing hookup moratorium area, would increase the pressure for growth in rural areas in the Lake Thunderbird drainage, where septic tanks can be utilized on relatively large lots. Extensive development beyond the relatively compact urban core would be counter to the adopted comprehensive plan and would increase costs and environmental impact.

Service area. Norman proposes to extend the service area of the municipal sewer system according to population projections which were prepared in conformance to the COMPLAN; the plan is aimed at accommodating projected growth, providing services in a cost-effective manner, preserving agricultural lands, protecting the Lake Thunderbird drainage, and generally minimizing the adverse environmental impacts of growth. The specific proposals principally involve new service to a small portion of the Little River basin which is on the fringe of the currently urbanized area.

The proposed expansion of the service area into previously unsewered basins would facilitate future development of approximately 1,500 acres of prime agricultural lands and 3,100 acres of additional land of local and state-wide agricultural service importance. These lands account for about 1.5 percent of the county's important farmlands, as defined by the U.S. Soil Conservation Service. However, most development would occur after the year

2000; a total of about 600 acres would be absorbed by the end of the planning period, or 0.2 percent of the important farmlands. The sewers which would serve the expanded service area are sized to accommodate only the growth projected through the year 2000. For the remaining land in these basins to develop, additional interceptors would have to be provided which would require review and approval prior to construction. The proposed facilities would, therefore, affect no more than 600 acres of farmland in the expanded service area. Most of the agricultural land which would be impacted is pasture or rangeland. Negative impacts of the proposed service area expansion on agricultural land would be minor because: large acreages of important farmlands would remain; there would be no impact on Norman's most productive agricultural lands, which are located in the western-most part of town; remaining agricultural areas would be protected by encouraging urbanization to occur in a compact, orderly form; and additional high-density growth could not occur without review and approval for the construction of new interceptors.

Nearly 4700 acres of the Little River basin that are currently undeveloped would be opened to potential development at urban densities (8 people/acre or more). This development would increase the potential that urban runoff would contaminate Lake Thunderbird. But, as for agricultural lands, the actual impact of the proposed expansion would be much less. About 600 presently vacant acres would be expected to be developed by the year 2000. The magnitude of change in the water quality of Lake Thunderbird is illustrated by phosphorus loadings to the lake, which would increase by approximately three percent above present loadings. From all sources in the watershed, phosphorus loadings could increase by 50 percent by the year 2000. Most of this change reflects growth outside the Norman city limits, especially in the city of Moore. Additional development past the year 2000 would further increase the potential for pollutants to reach the reservoir. These estimates do not account for the potential mitigating effects of ponds within the watersheds, or the benefits from implementation of the city's new drainage ordinance.

It is not certain that the increased phosphorus loading would result in any major change in the chemistry or biology of the reservoir. The high sediment load in the lake could fully compensate for the increased pollutant loading by: a) adsorbing many of the contaminants; and b) reducing the availability of light which is a prerequisite to nuisance algal blooms. Still, there is some risk that phosphorus concentrations would cross a significant threshold, and lead to major and even irreversible changes in the reservoir. The conclusion, then, is that there is a potential for adverse impacts on Lake Thunderbird from land conversion, but that harm is not certain. The growth facilitated by the expanded service area accounts for only a portion of the impact; in combination with other projected growth it could be a cause for concern.

Alternatives to the proposed service area could have more significant adverse impacts on the community as a whole. For example, the most realistic alternative would be to attempt to shift the growth to the west of town in the South Canadian basin. However, this area contains Norman's most productive farms which would be lost as land was converted for urban use. Further, this would not preclude development in the sensitive Little River basin, because growth in Moore, rural Norman, and elsewhere would continue to impact the reservoir.

Collection system. The location and sizing of all facilities is determined by the ACOG population projections, consistent with the COMPLAN, and by the requirement that all sewage collected in the Little River basin must be pumped into the Canadian basin, since discharge of wastewater within the Little River basin is prohibited by regulation of the Central Oklahoma Master Conservancy District and by Oklahoma's Water Quality Standards.

Specific interceptor routing alternatives included the following factors. 1) Parallel existing interceptors with new ones; this approach, which uses existing rights-of-way, was selected when feasible unless construction impacts were severe. 2) Rework the system to divert excess flows into an interceptor which has adequate capacity; this potentially inexpensive approach was selected in those few cases where an overloaded line is close to one with excess capacity. 3) Build new interceptors from developed and developing areas to the treatment plant; this was generally chosen when it allowed selection of a right-of-way along a drainage route or outside already developed areas, in order to minimize construction costs and impacts.

The Applicant proposes to construct approximately 14.7 miles of new sewer lines by the year 2000 under the construction grant; however, with the possible exception of the Bishop Creek interceptor (lines C-1 and C-2), none of the linework is considered eligible for EPA funding at this time. In addition, over 23 miles of sewer line not eligible for funding must be installed to correct current problems. Construction impacts, such as erosion, noise, traffic disruption and disturbance of previously-undetected archaeological sites, will be mitigated by measures which will be defined during the design and construction phases of each construction project, when alignments are defined precisely. One line passes near a wildlife preserve; special measures may be needed to avoid impacts to this area. Portions of four interceptors would be located in flood plains. These lines, along Imhoff Creek, Bishop Creek, Normandy (Merckle) Creek, and an unnamed tributary of the Little River, would have special impacts associated with flood and erosion hazards. In some places dewatering may be necessary due to a shallow water table.

Wastewater treatment and disposal. Seven major engineering concepts were considered for expanding or replacing the existing plant. Four of the seven alternatives are designed to accomplish secondary treatment, the minimum which will be required of the Norman plant. The remaining three alternatives are intended to provide very advanced treatment, including nutrient removal, which is the most restrictive requirement now being considered.

Table 1-1 summarizes the evaluation of the alternatives; the table includes the total dollar cost of each treatment process and a comparative ranking of the alternatives with respect to a number of economic, engineering and environmental issues. On the basis of the rankings, the facilities plan

TABLE I-1. RANKING OF WASTEWATER TREATMENT ALTERNATIVES.

1 is 'best'; 3 is 'least desirable'.

	Level A (Secondary)				Level D (Advanced)		
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
	Jet Activated Sludge	Biofilter/ Jet Activated Sludge	Biofilter/ Conventional Act. Sludge	Biofilters/ Bio-discs	Biological Nitri-fication	Breakpoint Chlorination	Land Applica-tion
Present Worth of All Costs	$ 13,451,523	13,650,275	12,262,105	11,561,778	29,121,323	32,688,093	47,197,276
Evaluation Parameters:							
Dollar Costs	3	3	2	1	1	2	3
Operation and Maintenance	3	3	2	1	2	3	1
Reliability	2	1	1	2	2	1	2
Adaptability	3	1	2	1	1	1	3
Environmental Considerations	2	2	2	2	1	1	3
Public Acceptability	3	3	2	1	1	2	3
TOTAL	16	13	11	8	8	10	15

Sources: PSC, 1981.

considers that alternative 4 (bio-discs) is the preferred method for accomplishing secondary treatment and that alternative 5 (biological nitrification) is the best means of further upgrading the facility for advanced treatment, if required. The selected options feature low dollar costs and good engineering characteristics related to operations, reliability and adaptability; environmental impacts are similar to or less severe than for other alternatives.

Wastewater reuse. Arrangements are in progress to possibly utilize a portion of the treated wastewater for golf course irrigation at the University of Oklahoma. A different land application alternative, presented in table 1-1, would provide a combination of wastewater treatment and reuse. This alternative would eliminate discharge to the river, which would reduce the potential of the river to provide beneficial uses that relate to quantity. On the other hand, quality impacts of wastewater discharge would be eliminated if land application is implemented. Reasons for rejecting land application include: the large land requirement (3,930 acres) which required consideration of a relatively distant site; displacement of residences at the site; the high dollar costs of land, storage ponds and a pipeline; and potential odors at storage ponds.

Sludge management. Three specific alternatives for sludge management were considered in detail. Table 1-2 summarizes the evaluation of the alternatives; the table includes the total dollar cost of each management method and a comparative ranking of the alternatives with respect to a number of economic, engineering and environmental issues. On the basis of the rankings, alternative B appears to be the most cost-effective method. It is the least costly, uses the least amounts of energy and chemicals, is the most easily modified, and is the most similar to current sludge management.

Other alternatives. Continuation of existing practices is proposed with respect to: management of on-site systems and septage; disinfection by chlorination. Energy conservation was a major factor leading to the selection of bio-discs for secondary treatment. Energy conservation measures related to detailed design of the treatment system will be considered during facility design. Odor at the treatment plant will be reduced by construction of a screw pump lift station.

Federal funding will be sought for the eligible portion of the proposed construction. Monthly residential sewer use fees would be about $15.00 per month at one-hundred percent local financing, compared to about $4.00 per month at present. Alternative means of financing now being considered include: sales tax; increased connection fees; the use of stand-by charges; and the establishment of specific policies towards financing of interceptor extensions.

C. COMMENTS ON DRAFT EIS

A Public Hearing on the Draft EIS was held in Norman on September 2, 1982, and written comments were accepted through September 13, 1982. The relatively

TABLE I-2. SUMMARY OF EVALUATION OF SLUDGE MANAGEMENT ALTERNATIVES.

Ranking of 1 is 'best'; 3 is 'least desirable'. See table 5-7 for more detail.

	ALTERNATIVE A Lime Conditioning Land Application	ALTERNATIVE B Anaerobic Digestion Land Application	ALTERNATIVE C Codisposal Cogeneration
Total Present Worth a/			
Level A	$ 5,241,850	$ 5,216,850	$ 8,346,440
Level D	$ 7,880,198	$ 7,855,198	$10,434,400
Evaluation Parameters:			
Dollar Costs	2	1	3
Energy Use	2	1	3
Chemical Use	2	1	3
Land Use	3	2	1
Energy Production	3	2	1
Fertilizer Value	1	2	3
Cost Recovery Potential	2	3	1
Ease of Implementation	2	1	3
Ease and Flexibility of Operation	1	2	3
Process Control	1	2	3
Safety of Operation	2	1	3
Odor Potential	3	2	1
Bacterial/Viral Safety	2	3	1
Air Quality Impacts	2	1	3
Water Quality Impacts	2	3	1
Public Acceptance	2	1	3
Total	32	27	37

a. For alternative C, costs are for sludge portion only. See table 5-6.

few comments on the Draft EIS included suggestions to prohibit development in the Little River basin, or to implement strict controls on development there; to consider water conservation measures to reduce sewage flows; to build a sewer loop connecting the Crystal Heights lift station to lift station E, rather than building lift station D; to establish financing policies whereby new development would pay all costs for sewage service to that development; and to re-evaluate costs for the land application alternative. Most other questions addressed specific technical aspects of the Draft EIS which were unclear or incorrect. Responses to the comments are provided in the Final EIS in four forms: 1) Appendix A contains copies of the written comments, with responses; 2) major issues are discussed in Part II; 3) an Errata section in Part III provides minor changes/corrections to the Draft EIS; 4) where more extensive changes were required, entire pages are included in Part III. Four maps have been revised and reprinted.

D. PREFERRED ALTERNATIVES

The city of Norman has selected the alternative which was recommended by the facilities plan engineer, endorsed by the Citizens Advisory Committee, and adopted by the Norman City Council. As its preferred alternative, Norman proposes to expand its service area to the north and east, in conformance with the city's COMPLAN, and to construct interceptor and collection sewers and lift stations necessary to relieve current overloaded conditions and to accomodate projected sewage flows through the year 2000; to upgrade the present treatment plant using bio-discs to provide secondary treatment; and to build sludge facilities for anaerobic digestion followed by a combination of wet-injection disposal and dewatering/stockpiling/land application. Additional treatment may be necessary depending on final water-quality standards and wasteload allocations. Table I-3 summarizes the environmental impact of the Applicant's preferred alternative. The cost of the proposed facilities is as follows:

interceptors and related improvements	$ 9,802,404
treatment works and sludge management	$ 16,788,628
TOTAL COST	$ 26,591,032

Note that the above cost is exclusive of the expense of constructing collection systems in areas of new development, and of providing any advanced treatment units which may be necessary in the future to ensure compliance with water-quality standards.

The preferred alternative is viewed by the Applicant as being: 1) the most adaptable in the face of changing federal regulations for effluent and sludge disposal; 2) the most flexible in terms of construction and operation especially for near-term solution of NPDES compliance problems; and 3) the lowest in total dollar costs.

EPA has delegated authority for review and approval of facilities plans, plans and specifications, and construction grants for wastewater treatment

TABLE I-3. SUMMARY OF IMPACTS OF THE APPLICANT'S PREFERRED ALTERNATIVE.

Adverse impacts are generally those which cannot be avoided except by the No Action Alternative; most of the adverse impacts can be mitigated. In addition to impacts identified below, substantial short-term benefits are associated with construction jobs, expenditures.

ENVIRONMENTAL RESOURCE	SHORT-TERM ADVERSE IMPACTS	LONG-TERM ADVERSE IMPACTS	POTENTIAL MITIGATION MEASURES	LONG-TERM BENEFITS
EARTH RESOURCES	Accelerated water erosion resulting from construction of facilities, especially where sewer lines lie in or cross a waterway	Sludge injection sites could experience metals buildup in soils	Erosion control measures such as berms, limitation of exposed earth; construction during low wind/rain season; stabilize bank cuts structurally; limit sludge application rates; industrial pretreatment to remove metals; monitoring at sludge sites	Improved soil properties at sludge injection sites
WATER RESOURCES	Near treatment plant, dewatering during construction could cause water-table lowering, odors, water-quality changes	New interceptors located in flood hazard zones; degraded water quality in ruoff; potential degradation of water quality of Lake Thunderbird and of ground water beneath sludge disposal sites	Identify potentially impacted wells & notify owners; structurally stabilize bank cuts in flood hazard zones; use detention ponds and other runoff controls; detain and treat runoff	Increased flows in Canadian due to greater wastewater discharge; improved quality of the Canadian, due to enhanced quality of effluent
AIR QUALITY; ODOR; NOISE	Equipment exhausts, dust and noise construction	Small increase in emissions, noise at treatment plant; potential odors from sludge land application sites	Spray or mulch disturbed surfaces; reseed; enforce OSHA standards to protect against noise; fully incorporate sludge into soil	Reduced odors at treatment plant and from collection system
BIOLOGY	Temporary loss of vegetation and habitat at some construction sites, especially waterways	Possible removal of some trees along creek alignments; potential decrease of fish in Lake Thunderbird and wildlife which feed on fish	Limit work to designated construction sites; protection of trees; no use of pesticides, herbicides, or defoliants; protect Lake Thunderbird through control of development and runoff	Improved aquatic habitat in the Canadian; productivity and habitat value of sludge injection sites ultimately improved
ARCHAEOLOGICAL & HISTORICAL RESOURCES	None expected	Possible loss of archaeological/historical resources at new facilities and from urban growth facilitated by sewer system; significant impact not likely	Perform site surveys prior to construction, with evaluation, rerouting, or salvage as necessary; identify and set aside archeaological and historical resources	None
SOCIO-ECONOMICS AND LAND USE	Traffic and utility disruption along construction corridors; reduced access to businesses and homes	Loss of agricultural land to support growth; potential impact on water quality of Lake Thunderbird with attendant impact on its value as a water supply and recreational resource; substantial increases in sewer rates or property taxes	Plan construction to minimize traffic and utility disruptions; use alternative methods to retire high cost revenue bonds (sales tax, increases in connection fees, stand-by charges); protect Lake Thunderbird by development and runoff controls	System supports compact urban form which minimizes impacts on agricultural land & supports planned infrastructure; reduction of potential health hazards from overflows; potential use of interceptor routes for trails; restoration of land values and construction activity in Bishop Creek area
ENERGY AND OTHER RESOURCES	Utilization of energy and resources during construction	Wastewater treatment requires major commitments of funds, labor, energy, materials	Produce and use methane gas; if and when feasible, sell sludge	Net reduction in per capita resource use for wastewater treatment; support of compact urban form which requires less energy use

facilities under the Clean Water Act to the Oklahoma State Department of Health. The preferred funding recommendation of the United States Environmental Protection Agency to the Oklahoma State Department of Health is to fund grant-eligible portions of the Applicant's preferred alternative, with certain conditions, and subject to availability of funds and to priority designations. Although planning included advanced treatment alternatives, the preferred decision of EPA and OSDH is to approve and support construction of secondary treatment units while deferring advanced treatment decisions until water-quality standards and wasteload allocations have been finalized. The final decision will be presented in a Record of Decision, which EPA will issue following the review period for this Final EIS.

PART II. CONSULTATION AND COORDINATION

This Part of the Final EIS briefly discusses the public participation prior to preparation of the Draft EIS (Section A), explains the process through which the Draft EIS received public review and summarizes the comments received (Section B), and provides an overview of EPA's responses to the major issues raised by the respondents (Section C).

A. PUBLIC PARTICIPATION PRIOR TO RELEASE OF THE DRAFT EIS

Chapter 7 of the Draft EIS contains a summary of public involvement in the planning of wastewater facilities for Norman. The Norman EIS was begun in mid-1978, when requirements with respect to public participation and scoping meetings were less formal. Public input was received principally by: 1) frequent meetings of the Citizen's Advisory Committee (CAC), appointed by the city in 1978; 2) public meetings held by the CAC; 3) a public hearing on the Bishop Creek Relief Lines Project, held on September 18, 1980; and 4) CAC meetings to review the draft facilities plan and the preliminary draft EIS. A series of public CAC meetings was held for the purpose of identifying significant issues to be addressed. At these meetings, the following issues were addressed:

Priority ONE issues:

1. Protection of Lake Thunderbird as a drinking water supply. This includes the Little River above Lake Thunderbird, and ponds near Hall Park. It is recognized that the Hall Park wastewater system may become part of Norman's problem whether we desire it or not.

2. Protection of ground water in the Garber-Wellington Formation.

3. Protection of water in stream alluvium.

4. Management of growth and city services, including the industrial potential of the city.

5. Protection of the South Canadian River as a recreational outlet, a wildlife habitat, and a place where unusual flora are known to grow.

6. Condition of sewers and sewer service in the established areas of Norman, including state of repair, and adequacy of capacity.

7. Control of odors.

8. Concern for dangerous chemicals entering the water supply, including non-point sources.

9. Improvement of the Bishop Creek interceptor as a specific plan item in order to provide remedial wastewater facilities on the east side of Norman.

10. Location, type, and capacity of additional treatment plant facilities. This should take into account type of treatment, potentials for energy and cost savings, and associated potentials such as land application and other innovative or advanced methodology.

11. Erosion and sediment control, from the standpoint of the land itself, as well as the effect on Lake Thunderbird and any streams affected.

12. Sludge disposal and composting, taking into account where it may go for a protracted period of years, and its use for practical purposes, including possible sale of the sludge as a commercial product.

13. Inter-relationship of storm sewers and wastewater sewers, with the aim of minimizing mutual interference of the two.

14. Necessary new or modified ordinances to assure proper use of wastewater facilities, in particular ordinances concerning industrial use and recovery.

15. Assurance of compliance with EPA standards.

Priority TWO issues:

1. Relative costs of alternative systems, in terms of initial capital outlay, maintenance costs over future years, and tax costs of the future.

2. Effect of high-density versus low-density residential land use.

3. Effect of growth on air quality.

4. Loss of agricultural land.

5. Effects on sewer utility rates.

6. Land acquisition problems.

7. Use of lift stations.

8. Coordination of the plan, as necessary or advisable, with other communities which affect Norman, or which Norman affects.

9. Legal restraints on the initial installation of the system, its use, and in applying financial charges for its use.

Priority THREE issues:

1. Protection of Lake Eufaula.
2. Protection of the Little River below Lake Thunderbird.
3. Road and traffic problems during construction and future maintenance.
4. Employment opportunities for the construction phase and for operation of the expanded facilities.
5. Effects, if any, on aesthetics, and on archaeological or historical sites.

In addition to the above issues, additional concerns were identified by the Environmental Protection Agency in their Notice of Intent to prepare an EIS. These issues included the following.

A. Project alternatives - All feasible project alternatives, including the "no action" alternative, which are developed in the facility planning process will be evaluated to determine their environmental soundness. Special attention will be given to those alternatives which represent the most cost-effective actions.

B. Primary and secondary impacts - All primary and secondary impacts, both beneficial and adverse, that could result from proposed collection system or treatment plant construction, shall be evaluated. Primary consideration should be given to the following areas of concern:

1) Water quality,
2) Air quality,
3) Biological resources, and
4) Noise.

C. Socio-economic effect of construction and operation - Impacts of this project on the economic stability of the citizens, both directly and indirectly, shall be analyzed.

D. Archaeological/historical resources - The city will follow the procedures of the Advisory Council on Historic Preservation and the Oklahoma Historical Society to insure the protection of archaeological, historical, and cultural resources.

B. REVIEW OF AND COMMENTS ON THE THE DRAFT EIS

The Notice of Availability of the Draft Environmental Impact Statement appeared in the Federal Register July 30, 1982. The Notice announced a 45-day public review period ending September 13, 1982. The public review period was scheduled to provide concerned agencies and the public an opportunity to review the Draft EIS and to offer comments on the adequacy of the draft statement and the environmental impact of the proposed action and its alternatives.

Over 200 copies of the Draft EIS were distributed to reviewing agencies and to interested members of the public. Copies of the Draft EIS also were made available to the public at three locations in the Norman area. During the review period for the Final EIS, copies of the Final EIS will be available at the following depositories:

1. Norman City Clerk's Office, 201 West Gray, Norman, Oklahoma.
2. Pioneer Multi-County Library, 255 North Webster, Norman, Oklahoma.
3. Oklahoma State Department of Health, Water Facilities Engineering Service, Construction Grants Division, 1000 NE 10th Street, Oklahoma City, Oklahoma.
4. U.S. Environmental Protection Agency, First International Building, 28th Floor, 1201 Elm Street, Dallas, Texas.

The Public Hearing was held in Norman, Oklahoma, on September 2, 1982. Public comment on the awarding of funds for wastewater treatment facilities in Norman was solicited through formal oral testimony and written statements. In addition to announcement of the meeting in the above referenced Federal Register, the public was notified by advertisements in the Norman Transcript and the Oklahoma City Times, and by use of EPA's mailing list. Sixteen people spoke at the Public Hearing, excluding government officials and consultants involved in preparation of the EIS.

During the public review period, 18 comment letters were received. Along with the hearing record, each letter was reviewed to determine if it contained substantial comments which required a response in the Final EIS. Comments which presented new data, questioned facts and/or analyses, or commented on the issues bearing directly on the Draft EIS or the environmental impacts were fully evaluated and responded to, and as appropriate, changes or additions to the text of the Draft EIS have been incorporated into this Final EIS.

Table II-1 summarizes the comments received on the Draft EIS. Table II-1 is organized into three parts: Part 1 reviews comments received at the Public Hearing; Part 2 presents comments received from government agencies which have a formal role in EIS review; and Part 3 presents comments expressed by the general public in letter form. Parts 2 and 3 identify the sequence or control number assigned to each letter; these numbers will be used to refer to letter comments in the following text. Appendix A presents the full text of all letters received on the Draft EIS and the response to the issues raised. Issues raised at the Public Hearing are addressed in the next section, "Responses to Comments".

TABLE II-1. COMMENTS ON THE DRAFT EIS.

Part 1 of the Table lists comments received at the Public Hearing; Part 2 presents comments received from government agencies which have a formal role in EIS review; and Part 3 presents comments expressed by the general public in letter form. EPA's responses to issues raised at the Public Hearing are given in Part II, Section C of this Final EIS. Appendix A to the Final EIS contains copies of all letters received. All letters are assigned a sequential number, or control number, beginning with 1 for the first letter in the table; letters in Appendix A are presented in numerical order with their response.

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1. PUBLIC HEARING: SEPTEMBER 2, 1982, NORMAN, OKLAHOMA

A. Members of the Citizens Advisory Committee (CAC):

Commander James H. Davis, Chairman. Much of the comment at the Public Hearing was not pertinent to the EIS; EIS thoroughly addressed impact on Little River watershed; much of the impact of development in Little River basin is beyond the control of Norman or EPA; main purpose of the EIS is to address discharge to the Canadian River; advanced treatment is very costly and may not work; the Canadian River is not very fishable or swimmable; the Bishop Creek problem was a reason for the amount of time the EIS has taken; sludge alternative analysis involves some tradeoffs; Norman must move ahead with its wastewater program.

Gene Tyner. Effectiveness of CAC was hampered by difficulty in scheduling meetings; EIS needs to take into account a recent study showing eutrophication in Lake Thunderbird; EPA should approve only upgrading of existing facilities to meet discharge requirements, but deny funding for expansion of facilities which would facilitate urban development in Lake Thunderbird watershed; protection of Lake Thunderbird must be carried out on a regional basis; the COMPLAN will not be as effective as the EIS implies.

B. City and County Officials

Lillie Mae Goddard, Councilwoman, Ward 5. Decision of where to extend sewer service must also consider costs for providing water supply; restricting alternatives to conform to COMPLAN restricts analysis of how best to develop/protect the watershed; sizing of sewer lines should consider growth which will occur along Sooner Road; COMPLAN does not adequately address rural (Tier IV) development; Rural Estates development does not require storm drainage control, so that there are serious runoff problems, thus will urbanization or Rural Estates development damage the watershed less?; most of Norman's prime agricultural land is along the Canadian River in west Norman.

Charles Holt, Councilman, Ward 8. EIS raises more questions than it answers; questions whether Rural Estates development with septic tanks is cleaner than full-fledged urban development; concerned about costs; there are many uncertainties as to impacts of development in Little River basin on Lake Thunderbird and the level of treatment need to protect the Canadian River and Lake Eufaula.

Bill Harwick, Councilman, Ward 3. Came to listen; appreciates everyone being at Public Hearing.

J.T. Brown, Cleveland County Health Department. EIS contains errors regarding lot sizes for on-site systems; Appendix A should be revised to reflect changes in OSS requirements; EIS should consider use of detention ponds below all new developments to mitigate impacts of runoff from Little River basin.

B. Other Citizens:

Mark Derichsweiler, Sierra Club Conservation Chairman. Flow projections should be revised downward from 100 gpcd, according to impact of water conservation measures; new development should pay the costs of sewers and increased capacity at the treatment plant to serve that development; COMPLAN must be adhered to; favor land application for sludge disposal, but concerned about water-quality impacts; strongly support improving water quality in the Canadian River; oppose any urban-density development in the Little River basin until assurance can be given that the city's drinking water supply will not be destroyed; support development of trails along sewer routes.

Edward H. Helm, Norman Citizens for Civic Responsibility. Basic issue is growth in the Little River watershed; opposed to financing growth of the community through increased water rates, bond issues, and federal funds -- especially EPA funds; support healthy debate on quantity [growth] versus quality [Lake Thunderbird water quality]; support improvement of existing facilities, but not increasing quantity; oppose increasing service area into Little River watershed.

TABLE II-1. Continued.

Stanley Grossman. The estimated costs for land treatment appear too high and should be re-examined; conventional treatment systems have a poor record of working at their design level, whereas land treatment systems have an excellent record; Norman is a good location for land treatment; land treatment would qualify for a higher level of federal funding.

Marvin Baker. Somes of the figures should be redrafted; there are not many productive farms on the west side of Norman, decision to not develop there is not scientific or economic, but political; final EIS should have a much larger section on water conservation; basic weakness of the EIS, not the fault of EPA or Lee Wilson and Associates, is there must be a Little River basin land use plan which includes all municipalities in the basin.

Albert Thorstenberg. Questions about the percentages of Norman currently sewered and to be sewered.

Joseph A. Grzybowski, Canadian River Park Association. Deterioration of the Little River system versus deterioration of the Canadian River system doesn't leave options; concerned about impact of ash and chemical sludge disposal on Bishop Creek -- deterioration of Bishop Creek would lead to deterioration of the Canadian River; supports sewer route that avoids Oliver's Woods Preserve; favor land disposal for sludge, sites should not be close to water courses.

Anne Million. Would like to see alternatives pursued which follow the COMPLAN; would like to see a hookup policy which would enable Norman to fund its own facilities, rather than depend on federal funding; questioned why the present plant is inadequate to accomodate projected growth; questioned validity of 100 gpcd figure for sewage flow; Norman needs a water-conservation plan; concerned about potential for leapfrog development; would like more discussion of alternatives before implementing proposed facility.

Akos Kovach. Questions regarding EPA enforcement of NPDES standards, relation of proposed treatment to water quality standards, basis for assessing impacts of increased phosphorus loadings, rationale for developing in the Little River basin given projected increases in pollutant loadings; EIS did not address impacts to Lake Thunderbird; EPA should have advertised the Public Hearing and the city should have publicized it in the Norman Transcript.

Don Groves. Why did the EIS take four years?, construction costs have increased over that period; runoff from development in Little River basin can and should be controlled by sedimentation ponds, etc.; growth in eastern Norman has been restricted unnecessarily in the past; supports allowing residential development in Little River basin; questioned choice of engineer.

2. GOVERNMENT AGENCY REVIEW

A. Federal Agencies:

Letter 1. United States Department of Agriculture, Soil Conservation Service, Roland R. Willis, State Conservationist, Stillwater, Oklahoma.

Minor discrepancy concerning the area of agricultural land affected by the project; impacts on environmentally sensitive agricultural land are clearly described.

Letter 2. Department of the Army, Southwestern Division, Corps of Engineers, Barry G. Rought, Chief, Planning Division, Dallas, Texas.

EIS should be revised to indicate that archaeological surveys will be conducted prior to project construction.

Letter 3. Federal Emergency Management Agency, R. Dell Greer, Chief, Natural and Technological Hazards Division, Denton, Texas.

Some proposed interceptors appear to be located in the floodway; any encroachment in the floodway must be prohibited if it will cause an increase in flood base flow levels; construction in the flood plain must comply with Executive Order 11988 "Floodplain Management".

Letter 4. Department of Health and Human Services, Public Health Service, Center for Disease Control, Frank S. Lisella, Chief, Environmental Affairs Group, Environmental Services Division, Atlanta, Georgia.

Detailed research and appropriate water-quality studies are needed to effectively protect Lake Thunderbird; location of sludge disposal in close proximity to residential land may be inappropriate; potential vector impacts associated with each alternative should be discussed.

TABLE II-1. Continued.

Letter 5. Department of Housing and Urban Development, Fort Worth Regional Office, Victor J. Hancock, Environmental Clearance Officer, Fort Worth, Texas.

No comments.

Letter 6. U.S. Department of the Interior, Office of the Secretary, Bruce Blanchard, Director, Environmental Project Review, Washington, D.C.

DEIS inadequately addresses recreational and aesthetic value of Lake Thunderbird; adverse impacts on water quality and water use resulting from sewer extensions into Little River Basin may result in non-compliance with Oklahoma's water quality standards (anti-degradation policy); developers should be required to provide effective drainage systems; consideration should be given to providing stormwater retention basins; basinwide watershed protection is required for Lake Thunderbird; sponsoring agency and other agencies should consider developing trails (for jogging, biking, etc.) along sewer lines; the State Natural Heritage Program should be contacted for comments on the DEIS; no Indian-owned trust property will be affected by the proposed project; the presence of mercury in Lake Thunderbird should be discussed in greater detail; lead in the sediment could have adverse impact on the lake's aquatic life; EIS should reference the Norman Environmental Control Advisory Board's 1980 report on the Canadian River; further data on temperatures in the Canadian should be given; condition of the Canadian Fishery should not impact the need to improve water quality and meet the goals of the Clean Water Act; stringent controls should be enacted to abate non-point source pollution into Lake Thunderbird.

Letter 7. U.S. Department of Transportation, Federal Aviation Administration; Southwest Region, Gene L. Falkner, Manager, Planning and Programming Branch, Fort Worth, Texas.

No comments.

B. Oklahoma State Agencies:

Letter 8. The University of Oklahoma, Oklahoma Archaeological Survey, Larry Neal, Staff Archaeologist, Norman, Oklahoma.

Table 5-3 (Possible Construction Impact Mitigation Measures) lists no mitigation for adverse impacts on archaeological/historical resources. No consideration is given to the indirect effects of new wastewater treatment facilities on the preservation/destruction of archaeological/historical impacts.

Letter 9. Oklahoma Department of Economic and Community Affairs, Federal Assistance Management Division, State Grant-In-Aid Clearinghouse, Don N. Strain, Director, Oklahoma City, Oklahoma.

The state agencies comprising the Pollution Control Coordinating Board have reviewed the proposed project and agree that no adverse environmental impact is anticipated.

Letter 10. Oklahoma Tourism and Recreation Department, Oklahoma Natural Heritage Program, Ian H. Butler, Program Coordinator, Oklahoma City, Oklahoma.

No comment.

C. Local Governments:

Letter 11. Association of Central Oklahoma Governments, Zach D. Taylor, Executive Director, Oklahoma City, Oklahoma.

The draft EIS has appropriately responded to the environmental impacts that could reasonably be expected. The project is consistent with areawide plans, and funding for construction is urged.

TABLE II-1. Continued.

3. PUBLIC REVIEW

Letter 12. Lillie Mae Goddard, Council Representative, Ward 5, Norman, Oklahoma.

Urges EPA to approve expansion of sewer service into the Thunderbird drainage basin in order to prevent deterioration of the land due to uncontrolled, sprawled growth; supports building lift station E before extending service north of Woodcrest in order to encourage more compact development and because there is already a water supply in basin E.

Letter 13. H. L. Heiple, Heiple Law Offices, Inc., on behalf of the Norman Developers Council.

The proposed alternative will not create the lifting of the hookup moratorium in the Bishop Creek area (which is being lifted as a result of a Federal judgment against Norman), but EPA funds may expedite completion of new lines in the Bishop Creek area; agrees that the preferred alternative is that presented in the draft EIS; urges EPA funding of whatever alternative is chosen.

Letter 14. Canadian River Park Association, Inc., Joseph A. Grzybowski, Vice President, Norman, Oklahoma.

Planning is needed on a broader, inter-municipal scope for the entire watershed; the EIS could recommend sewerage for enough acreage to accommodate immediate development needs while awaiting more comprehensive planning; the EIS is erroneous in considering that wastewater discharge has positive values, particularly that it has highest benefit at low flow; water conservation and recycling options should be seriously considered; chemical and ash disposal sites should be located at a distance from stream courses; the biology section has several inaccuracies relating to bird habits and to the degree of aquatic life existing during low-flow conditions; interceptors should avoid the Oliver Wildlife Preserve; wastes disposed on the Canadian River floodplain may mix with river water due to lateral movement in the aeolian sands; Canadian River is correct, as opposed to South Canadian River; reproduction of the maps was poor.

Letter 15. Citizens' Association for Responsibility and Equity in Norman Government (Careing), Jo Juan Saults, Secretary, Norman, Oklahoma.

Opposed the proposed placement of lift station D, which would open to development an area with no water lines; support instead a line from Crystal Heights lift station to Woodcrest lift station, to lift station E and line E-1, which appears to be more cost-effective.

Letter 16. Sylvia G. Martin, Norman, Oklahoma.

If EPA funds the Bishop Creek improvements, the local ad valorum taxpayers should be refunded; preservation of Lake Thunderbird as a water supply should be the top priority; the COMPLAN will not serve the purpose of protecting the Little River Basin; rather than extending the present sewerage system, new development should have self-contained wastewater treatment systems for small areas; the wastewater facilities should be funded stepwise; will a sewer rate of $15 cover both construction and O&M costs?; the full name "South Canadian River" should be used; what effect do waste chemicals from Oklahoma University and hospitals have on the treatment plant?: what effect will the new Oklahoma City sewage plant have on water flow in the South Canadian River?

Letter 17. Gene and Jo Juan Saults, Norman, Oklahoma.

Oppose the proposed location of lift station D, support instead looping the sewer from the existing Woodcrest station to lift station E.

Letter 18. Larry D. Duncan, Norman, Oklahoma.

Concerned about the location of lift station D which is in the Little River Basin, on prime agricultural land, with no water supply system; a sewer line from Crystal Heights to Woodcrest to lift station E appears more cost-effective.

C. RESPONSES TO COMMENTS

For all comments which presented substantive disagreements or questions about the content of the Draft EIS, EPA developed a written response. All comment letters are presented together with responses in Appendix A. Most comments addressed specific issues, however, there were five general issues which were of particular interest to the public: development in the Little River basin and its impact on Lake Thunderbird water quality; the location of lift station D; water conservation and sewage flow reduction; allocation of costs for wastewater facilities to serve new development; protection of the Canadian River. These issues are discussed below; additional miscellaneous issues are grouped together under Issue 6, "Other Issues". Part III of the Final EIS contains revised versions of four maps in the Draft EIS which were modified in response to comments received. Minor editorial changes are noted in a list of Errata beginning on p. III-1.

ISSUE 1. PROTECTION OF LAKE THUNDERBIRD. As discussed in the Draft EIS (pp. 4-3 to 4-5), development in the Little River Basin, and the need to protect Lake Thunderbird, have been high priority issues for Norman citizens. Comments at the Public Hearing and in the letters raised several questions about the relationship between wastewater facilities in Norman and water quality in Lake Thunderbird.

Issue 1a. Some citizens testified that, given the uncertain impacts of development in the Little River basin on Lake Thunderbird, and that Lake Thunderbird is Norman's main water supply as well as recreational resource, no development in the Little River basin should be allowed. Further, the city would be in a better position to prevent watershed development by other communities, if Norman itself allows no development there.

> Response to Issue 1a. Decisions regarding development in the Little River Basin are a local responsibility. The adopted COMPLAN considered many tradeoffs of alternative development patterns in Norman and concluded that it is acceptable to allow limited growth in the Little River Basin. The analysis in the EIS supports the concept that such growth should be approached with caution, but found no basis for concluding that limited development should not occur. The proposed actions are projected to lead to development of about 600 acres of the watershed by the year 2000; in itself this is not expected to cause large changes in water quality. This limited growth would provide a good model for other communities in the watershed.
>
> The need to make decisions in the face of uncertainty is a constant problem in all environmental planning. However, waiting to make decisions until there is certainty is unwise because: certainty is seldom, if ever achieved; delay itself may cause adverse impacts which may outweigh the effects of proceeding. This does not mean that one should always go forward despite inadequate information. Rather, there needs to be a careful balancing of the tradeoffs among different actions, including consideration of worst-case scenarios. This balancing must be performed

in a public arena. Actions which would cause regulatory violations, or which lead to impacts which are clearly contrary to public policy, must be rejected. The choice among remaining alternatives, including the no-action alternative, must be made by representatives of the affected population. A major role of the EIS was to provide input to the balancing process and public decision-making in Norman. The resulting decision, to allow some cautious growth, is consistent with existing policies and regulations and appears to be supported by the general public. While EPA may condition construction grants to require mitigation of impacts in the Little River Basin, the agency does not propose to take any actions to prohibit limited sewer construction in that basin.

Issue 1b. Why is there uncertainty about the impacts of development on Lake Thunderbird? What studies have been done to reduce the uncertainty?

Response to Issue 1b. As discussed in the previous response, uncertainty is common in environmental studies. As discussed in a report prepared in conjuction with the EIS: "Land Use and Water Quality in the Little River Basin, Oklahoma" (LWA, 1981a), the state-of-the-art is not well advanced regarding the effects of urbanization on water quality, and regarding the ways in which lakes respond to non-point source pollution. In large part this reflects the complex nature of the problem; another factor is that most of the literature deals with cold, natural lakes in the north, as opposed to warm, turbid reservoirs in the south.

Compared to many reservoirs, Lake Thunderbird is well studied. For example, as part of its water-quality management planning program, ACOG conducted an extensive study of existing and projected water quality in the ACOG area, including Lake Thunderbird. EPA included Lake Thunderbird in its National Eutrophication Survey. Many studies of Lake Thunderbird water quality have been performed by other state and federal agencies and by University of Oklahoma students and professors; these studies are discussed in section 6.2 of the Draft EIS and in the separate report cited above. The report also identifies studies which could be performed to improve the data base regarding Lake Thunderbird. However, fully-informed decisions regarding lake management will not be possible without improvements in the state-of-the-art regarding eutrophication analysis.

Issue 1c. A regional plan, including the City of Moore and other governmental bodies within the Little River Basin, is needed in order to fully protect Lake Thunderbird.

Response to Issue 1c. EPA agrees with this comment and encourages local agencies and governments to develop a regional water-quality management plan for the Little River basin. Under present EPA and State policies, management of nonpoint sources is to be implemented at a local level, on a voluntary basis. The Central Oklahoma Master Conservancy District and/or the Association of Central Oklahoma Governments could provide the institutional framework necessary for such a plan. EPA and the State will provide publications, model ordinances and other types of technical assistance to assist in the formulation of a control program for nonpoint sources. See Section B, Part IV of this Final EIS.

Issue 1d. Runoff from development in the Little River basin should be carefully controlled through measures such as stormwater detention ponds.

Response to Issue 1d. This issue in addressed on p. 5-47 of the Draft EIS. Detention ponds generally provide some water-quality benefits in addition to being useful for flood control; other techniques, especially on-site drainage control are also of value. The recently adopted drainage ordinance in Norman provides a mechanism for the implementation of appropriate control measures. A similar approach would be desirable as part of a regional management plan for the Little River Basin. As stated in the DEIS, EPA has conditioned construction grants for sewage facilities for the city of Moore, requiring certain urban control measures to be taken in order to reduce the impact of increased sedimentation to Lake Thunderbird. EPA and OSDH may apply similar conditions to any construction grant awarded to Norman.

Issue 1e. Because of its great toxicity and bioaccumulation in the food chain, mercury levels, sources and treatment needs should be considered in greater detail.

Response to Issue 1e. Scant data on mercury in Lake Thunderbird exist. OSDH (1979) lists one value for mercury, taken in 1971. The value was 2.0 ug/l, which is equal to the drinking water criterion and 40-times the aquatic life criterion. No data for mercury in the sediment or fish tissue have been identified. General sources of mercury include leaching from geological formations, smelting of ores, industrial and agricultural applications, burning of fossil fuels, and dumping of consumer products into sewers. Since no discharges are allowed within the Little River Basin, mercury in that watershed must be due to natural souces or to atmospheric fallout. Note that ACOG found contaminant levels in the Little River Basin to be similar to or less that levels elsewhere in the ACOG region (p. 6-19 of DEIS).

If mercury concentrations do reach levels above the drinking water standard, additional treatment of Lake Thunderbird water may be required. Removal methods for mercury include alum and/or iron coagulation, lime softening, powdered or granular activated carbon, and ion exchange. The effectiveness of each method is dependent on factors such as pH and turbidity. Inorganic mercury is removed much more easily than organic mercury. Preliminary estimates of the costs of mercury removal from Lake Thunderbird water to meet Norman water supply needs were made for this Final EIS. Assuming that all the mercury were in inorganic form, and that the concentration were no greater than 70 ug/l, ferric sulfate coagulation could provide adequate removal. Construction cost for a ferric sulfate feed system would be approximately $30,000 and annual operation and maintenance costs (O&M) would be about $25,000. However, if a significant portion of the mercury were in organic form, or if the concentration were higher than 70 ug/l, a more sophisticated technology such as activated carbon or ion exchange would be required. Ion exchange could provide adequate treatment for up to 100 ug/l of inorganic and/or organic mercury. Construction cost would be on the order of $700,000 and annual O&M would be around $230,000 per year. These two scenarios provide a range of costs which could be incurred if ever a mercury problem were to develop. Dependent on the factors mentioned above and the type of treatment chosen, the hypothetical cost could be anywhere in-between. More detailed calculations are on file at Lee Wilson and Associates, Inc., P.O. Box 931, Santa Fe, New Mexico 87501.

Note that while treatment for the water supply is feasible, increased mercury levels may have an adverse impact on Lake Thunderbird as a fishery and on animals which eat fish. In fish tissue, mercury accumulates to concentrations as much as 10,000-fold those in the water. Mercury concentrations near the standard for aquatic life (0.05 ug/l) are not particularly toxic to fish, but the standard is designed to protect animals and humans which may eat the fish.

Issue 1f. The DEIS does not adequately address the recreational and aesthetic value of Lake Thunderbird.

Response to Issue 1f. Recreational facilities at Lake Thunderbird include a marina, boat launching ramps, an overlook, and several swimming and picnic areas. The resevoir is used extensively for boating, water skiing, sport fishing, swimming, birdwatching, and picnicking. Lake Thunderbird's importance to recreation is noted on p. 6-9 of the DEIS; use of the lake for fishing and as a habitat for aquatic birds is discussed on p. 6-50. General impacts on the water quality of Lake Thunderbird are discussed in section 6.2.7; impacts on recreational use and aesthetics are discussed on p. 6-33. All these topics are further elaborated in the Little River Basin Report (LWA, 1981a).

Prediction of recreational and aesthetic impacts faces the problems described in the response to Issue 1b. However, in general the effects of increased development of the basin can be expected to include: some increase in the frequency and/or magnitude of algal blooms, which could impair recreation by producing more turbid and unsightly water (possibly accompanied by increased odors); increased potential for algal toxicity to swimmers (although, as discussed in the Little River Basin Report, this impact is not considered likely); greater potential for accumulation of toxic substances in the food-chain, possibly harming the reproduction or vitality of game fish and/or placing constraints on the eating of fish; more frequent periods during which bacteria concentrations exceed levels considered safe for swimming.

As with other impacts, there is no evidence to mandate a no-growth policy in the Little River Basin; but the problems are of sufficient concern to justify basinwide water-quality planning and implementation of cost-effective measures which would serve the dual purpose of encouraging sound land-use practices and the mitigation of adverse water-quality impacts arising from non-point sources which are related to urbanization.

Issue 1g. The proposed facilities may result in non-compliance with Oklahoma's Water Quality Standards (Anti-Degradation Policy).

Response to Issue 1g. The Anti-Degradation Policy does not prohibit any specific type of activity, as long as existing water uses are maintained. See the responses to Issues 1a and 1b.

Issue 1h. Protection of Lake Thunderbird is predicated upon adherance to COMPLAN, yet the COMPLAN has already been amended several times; thus, it appears that COMPLAN will not serve the purpose of controlling growth in the Little River basin. Objection was also made to limiting the analysis of alternatives to those within the scope of the COMPLAN, since this limits the ability of the EIS to evaluate the best methods for protecting the watershed and agricultural land in a cost-effective manner.

Response to Issue 1h. Alternatives considered in the facilities planning would be consistent with the original COMPLAN. Note that the COMPLAN includes procedures for amendment, including detailed public notices, Planning Commission review and recommendation, and, ultimately, City Council approval. It is the City's opinion that all actions regarding changes in Tier designations, land-use designations, major streets and highways, or COMPLAN policies and strategies have occurred with full adherence to the COMPLAN amendment procedures. The City also believes that the stated policies and intent of the COMPLAN have been followed in that all Tier amendments have involved a change in designation from Tier III (Urban Reserve) to Tier II (Urbanizing); so far, there have been no changes in areas designated as Tier IV (Rural Area). In other words, the changes do not alter the area which was planned ultimately to be urbanized.

The reason for limiting the EIS to alternatives dictated by the COMPLAN is given on pages 4-4 and 4-5 of the Draft EIS. EPA views comprehensive land-use planning as a local issue, which should be addressed at the local level. Methods for protecting the watershed, beyond the scope of COMPLAN, were considered in the Little River Basin Report (LWA, 1981a). These methods include: control of pollutant sources (e.g. soil erosion control, limitation of pesticide and fertilizer use, litter control); control of stormwater runoff (e.g. detention ponds, construction of artificial wetlands, restrictions on the amount of impervious land surface); and lake management (e.g. lake aeration, chemical treatment, biological manipulation). See chapter 12 in the Little River Basin Report for further discussion.

Issue 1i. The Draft EIS does not take into account studies which indicate that Lake Thunderbird already is eutrophic.

Response to Issue 1i. Data on algae and other indicators of eutrophication are presented in the Little River Basin Report (LWA, 1981a).

Section 6.2 of the Draft EIS summarizes existing and projected levels of chlorophyll a, a measure of eutrophication. See also Part III, Section A, Errata for page 6-19. No report is yet available for the specific study alluded to in the comment. Algal conditions that might be considered eutrophic were noted as early as 1974 (though eutrophic conditions have not been observed in most of the years since then). The conclusions in the Draft EIS took such reports into account. However, for reasons discussed in the Draft EIS and in the Little River Basin Report, it is difficult at this time to establish what effect increased pollutant loadings will have on the eutrophic status of the reservoir, especially since there is a potential that sediment-related turbidity will control algal growth, despite possible increases in nutrient loadings.

Issue 1j. The EIS argues that shifting growth to the west side of Norman, as an alternative to growth in the Little River Basin, would result in the loss of productive farms. However, there are not in fact many productive farms in that area; the decision not to urbanize in that direction is political, not scientific or economic, and reflects poor judgement.

Response to Issue 1j. The Draft EIS should have read farmlands rather than farms; see Part III, Section A, Errata for page 5-8.

The statement is based on the Soil Conservation Service Survey of Important Farmlands in Cleveland County. That survey has three major categories of important farmlands: a) prime lands, which are the most productive; b) additional farmland of statewide importance; c) additional land of local importance. Nearly all land within Norman, excluding urbanized areas, is classified as important farmland, but roughly 3/4 is within the "additional" categories (b and c). In contrast, most land west of the urban area is in the prime cropland category, and one of the largest areas of prime croplands in the county is located there.

Which lands to preserve is a local policy decision. The COMPLAN reflects a decision to preserve as much of the prime lands as possible, and thus to direct growth to the east rather than to the west. In the comments on this EIS, several citizens pointed out the increased expense of pumping the water supply to the west side, and cited this as a reason for developing on the east side.

ISSUE 2: LOCATION OF LIFT STATION D. Several citizens (including Councilwoman Goddard) opposed the location proposed for Lift Station D, in order to avoid leapfrog development. Some recommended that Lift Station E be built before D.

Response to Issue 2. The Draft EIS discussed an alternate site for Lift Station D, at the intersection of lines D-2 and D-3. Recently, the Norman City Council directed that Lift Station D be built at a site which is south of Franklin and west of 12th, just outside the boundary of the Wildwood Hill Estates development. This site is one of three alternatives presented in a preliminary engineering design report for Lift Station D, and was chosen by the City Council after two study sessions. The site falls between the two sites discussed in the Draft EIS (p. 5-19). This location for Lift Station D will open up approximately 325 more acres than would have been opened by alternate site of the Draft EIS, but will not facilitate urban sprawl as would have been the case with the originally proposed site. Within basin E, a lift station to serve the Royal Oaks development is being constructed at this time by the developer; this lift station will serve a part of the basin which would have been served by Lift Station E.

ISSUE 3: WATER CONSERVATION. A number of comments indicated that the facilities plan and/or EIS should consider water conservation alternatives which could reduce the wastewater flow to below the 100 gallons per capita per day (gpcd) which was used as the basis for sizing of proposed facilities.

Response to Issue 3. The 100 gpcd was selected as a reasonable round off of the measured per capita flow and was accepted by the EPA reviewers prior to preparation of the facilities plan. The areawide water-quality management plan which developed Norman's wasteload projections used 100 gpcd. The city investigated flow reduction by elimination of infiltration and inflow in its EPA-approved Infiltration/Inflow analysis; the analysis found that it was more cost-effective to transport and treat Norman's infiltration and inflow. Metering of water usage is a major technique by which flow reduction is often accomplished; however, the city already meters all water system users. The city could also require water saving appliances to be used in new construction; however, the majority of the wastewater flows will come from existing sources. The amount of reduction that might be accomplished is difficult to reliably estimate and could be offset by trends toward more water using appliances (disposals, icemakers, more bathrooms per house, etc.). 100 gpcd represents a reasonable estimate for a city the size and nature of Norman.

Note that, if future flows do fall below 100 gpcd, the effect will be to extend the design life of the facilities now proposed for construction.

ISSUE 4. FUNDING OF FACILITIES. Several comments were directed at the financing proposals contained in the facilities plan. Most of these expressed the belief that new facilities should be funded by the new developments which create the need for the facilities. One comment (letter 14) requested a tax refund if EPA reimbursed the City for any of the Bishop Creek now under construction.

Response to Issue 4. The facilities plan does not propose the construction of collector lines to serve individual users. EPA and OSDH do not propose to fund any linework which would serve future growth only. As new users tie into the system, they begin paying their share of the sewer system through the sewer-use charges and ad valorum taxes. The city requires developers to pay the cost of construction of the wastewater collection lines for their development. This cost is then passed on to the homebuyer.

The city is developing a sewer use and user charge ordinance which requires each user to pay their share of the cost of the collector lines providing them service. If the user ties to a sewer main, they will pay the equivalent cost of service by a collector line.

The existing treatment plant was designed for an average daily flow of 10 MGD (see pages 2-1 and 2-3 of the facilities plan). The treatment plant capacity is not being expanded by the proposed project. The plant is being modified to enable it to comply with effluent limitations which will be established to achieve water-quality standards. It will serve mostly existing flows. As new customers are tied to the system, they will begin to pay their share of the cost of the treatment facility.

If EPA funds are received for the Bishop Creek improvements, the City of Norman will use those funds to retire the bonds that have been issued to finance the Bishop Creek project. This would result in a reduction of future ad valorem taxes, compared to what they will be if EPA funds are not provided.

ISSUE 5. WATER QUALITY OF THE CANADIAN RIVER. The EIS implies that impacts of wastewater discharge during low flow are minimal, because no aquatic life can exist in the river at such times. However, fish find refuge in shaded pools and in tributaries to the river. The existing fishery and the natural phenomena that influence it should not affect the need to improve the river's water quality and meet the goals of the Clean Water Act. Several people expressed opposition to any lowering of the water quality standards for the Canadian River.

Response to Issue 5. The rationale for changing the beneficial use designation of the Canadian River, and thus the applicable water-quality standards, is summarized on pages 6-49 and 6-50 of the Draft EIS. The goals of the Clean Water Act are to make all navigable waters in the United States fishable and swimmable. To quote the ACOG report, "Inasmuch as fulfillment of the fishable/swimmable goal will ultimately require application of advanced levels of treatment and result in a significant commitment of public funds, many citizens and public officials ask the question: Is it worthwhile to achieve fishing and swimming in streams that naturally, for all practicable purposes, have no water during the summertime?" (ACOG, 1981a, p. 5-5). After consideration of the costs and benefits, and with public input, ACOG concluded that it would be more cost-effective to change the beneficial use designation for the Canadian to "Fish and Wildlife Propagation -- secondary warm-water fishery with primary warm-water fishery as a goal". The recommended water-quality standard change was adopted by the State, but has not yet been accepted by EPA. Adequate justification for the change must be presented prior to EPA approval. In addition, the wasteload allocation studies that determine the level of treatment needed to comply with the water-quality standards are not yet complete. Because the wasteload and water-quality standard issues in this area are not settled, the wastewater facilities planning for Norman has been conducted for multiple sets of effluent limitations. In this way, planning for the facilities has been allowed to continue, so that needed improvements can be initiated as soon as possible.

Upgrading of the Norman facilities (and of other wastewater facilities which discharge to the Canadian River) will result in improvement of the river's water quality, and will thus enhance fishing and swimming potential of the river. See also the response to comment 14-2 in Appendix A of this Final EIS.

ISSUE 6: OTHER CONCERNS. Several specific, technical concerns were expressed about other aspects of the EIS and/or facilities plan. These concerns, and the responses to them, are summarized below.

Issue 6a. Several concerns were raised regarding sludge management: opposition to codisposal was expressed; questions were raised about the proposed disposal sites.

Response to Issue 6a. Since publication of the draft EIS, the sludge management alternatives were modified by the engineer (PSC, 1982a). The modifications reflect 1) changes in Oklahoma State Department of Health regulations for sludge management, and 2) a recalculation of the costs of the codisposal alternative, in response to EPA comments. Section 5.4 has been rewritten, and is included in Part III of this final EIS. Under the city's preferred alternative, sludge will be disposed of on private cropland, rather than at one specific site. The chemical sludge disposal site would be needed only if wastewater treatment to level D were required. If the beneficial use designation for the Canadian is changed as now proposed by the State (see response to Issue 5), level A treatment may be sufficient. In the future, if a specific disposal site is needed, it will be designed to prevent pollutants from entering surface or ground water, and the site will be monitored. Review by OSDH will be required before issuing of a permit for any sludge disposal plan.

Issue 6b. Line B-1 should be routed so as to avoid Oliver Wildlife Preserve.

Response to Issue 6b. The City of Norman prefers the route for line B-1 which goes around, rather than through, Oliver's Woods. EPA will consider the option of conditioning their grant to require that the line avoid Oliver's Woods.

Issue 6c. Costs for the land application alternative seem too high, and should be reevaluated.

Response to Issue 6c. During the September 2, 1982, Public Hearing the facilities plan engineers submitted a written document entitled 'Responses to EPA Comment Letter Dated August 17, 1982, Concerning the Draft Facility Plan' which elaborated on the costs of the Land Application Alternative

[PSC, 1982a]. This detailed cost analysis presents the case for the cost of the land application alternative. Several site-specific items strongly affect the cost of the land application alternative, including the distance to the application site and the need for a major river crossing. Other potential land application sites would be even more costly. Since no discharge is allowed in the Little River basin, the only suitable site would be on the west side of Norman. Land in this area is relatively expensive, and the wastewater would have to be pumped uphill, with resultant high energy costs.

Issue 6d. Support was expressed for the idea of developing jogging/hiking/biking trails along sewer routes.

Response to Issue 6d. This possibility was noted on page 6-73 of the Draft EIS. At the Public Hearing, the City affirmed that they would consider this alternative at the time that routes for interceptors were finalized. EPA encourages the incorporation of recreational facilities in the development of wastewater treatment systems.

Issue 6e. Since the existing treatment plant was designed for 10 MGD, it is unclear why this plant is inadequate for a projected growth to 10 MGD. Also, the existing plant was designed for secondary treatment, but is not meeting its permit. Why, then, is the City proposing to choose the alternative of secondary treatment?

Response to Issue 6e. Wastewater flow is measured in two ways. The hydraulic loading refers to the quantity of liquid flowing through the plant. The organic loading refers to the quantity of material in the sewage which is subject to chemical/biological degradation. Although the existing plant was designed for an average hydraulic flow of 10 MGD, it is unable to adequately handle the associated organic load (see page 4-3 of the Draft EIS). Thus, the plant is not meeting secondary treatment standards. The proposed improvements to the treatment plant will not alter the hydraulic capacity of the plant, but will upgrade its ability to treat organic matter in the wastewater. The city has selected secondary treatment as a first stage. Additional treatment may be necessary to meet water-quality standards (see response to Issue 5).

Issue 6f. One speaker at the Public Hearing testified that one of the engineers for this project is being investigated by the U.S. Justice Department. Has the EPA Inspector General investigated the engineer? Should this engineer be used for Norman's wastewater facilities design?

Response to Issue 6f. It is inappropriate to address these issues within the forum of this EIS. If any impropriety is suspected, a letter should be submitted to the EPA Inspector General. Note that the investigations referred to have involved other companies, not the firm of Painter & Spitz Consultants Inc., which is the engineering firm for the Norman wastewater facilities plan.

PART III. MODIFICATIONS AND CORRECTIONS TO THE DRAFT EIS

Part III of the Final EIS contains revisions made to the Draft EIS based on: new or more complete information obtained since release of the Draft; modifications to standards and policies since release of the Draft; errors and omissions identified through the public review process; and internal review by EPA and the EIS consultant. Minor changes are incorporated into a list of Errata, Section A. More detailed changes were made in the sludge alternatives; therefore section 5.4 (Alternatives for Sludge Management) has been rewritten, as have each of the sections in chapter 6 pertaining to sludge management. The revised sections are presented in Section B. In addition to changes included in Part III, all of Chapter 1 (Summary) of the Draft EIS has been replaced by Part I of this Final EIS.

A. ERRATA

The following changes in the Draft EIS are of an editorial nature, and are relatively minor. Consequently, the affected pages have not been reprinted in full. These changes are to be incorporated into the Draft EIS. In each case, the erratum identifies the page, paragraph and line which has been revised, and then discusses the changes which should be made to correct the Draft EIS. References to Paragraph 1, etc., indicate the first full paragraph on a page. If no paragraph is cited, the lines containing the change will be found in the first partial paragraph on the page.

Page 5-8, paragraph 1, line 6. Change the word farms to farmlands.

Page 5-43, paragraph 4, line 4. Replace the sentence beginning "Minimum allowable lot sizes" with the following. City of Norman regulations limit all lot sizes within the city limits to a minimum of two acres when on-site systems are used.

Page 5-49. Replace Table 5-8 with the following.

TABLE 5-8. ESTIMATED SEWER USE FEES TO FUND PROPOSED WASTEWATER FACILITIES.

Amounts assume EPA funding of portions considered potentially grant-eligible by the facilities plan engineers. At 100% local financing, the average monthly residential sewer-use fee would be about $15.

	Amount Funded by the City	Annual Local Debt Service	Monthly Debt Service per Residence	Monthly Operation & Maintenance per Residence	Average Total Monthly Residential Sewer Use Fee
Maximum (Level D)	$ 10,231,921	$ 1,304,698	$ 3.39	$ 3.82	$ 11.21
Minimum (Level A)	$ 7,144,671	$ 912,136	$ 2.37	$ 2.26	$ 8.63

Sources: PSC, 1982; Schrempp, 1983.

Page 6-19. Between the first two paragraphs, insert the following paragraph. Algal data from some (but not all) years would be regarded by some water quality specialists as indicative of "eutrophic" or "algal bloom" conditions. A number of the algal species identified have been associated with odor and/or taste problems. Based on chlorophyll a levels, the lake would be classified as borderline between mesotrophic and eutrophic, though it is not clear that these definitions apply to warm, turbid lakes such as Thunderbird (LWA, 1981a).

Page 6-30, paragraph 5, line 2. Change 1030 acres to 1080 acres.

Page 6-33, paragraph 2, line 12. Append the following to the end of the sentence: however, bottom-dwelling organisms might be adversely impacted.

Page 6-40. Under the 1 Hour Max. for Photochemical Oxidants (Ozone), both primary and secondary standards, replace 40 mg/m^3 with 235 ug/m^3.

Page 6-48, paragraph 4, line 4. At the end of the paragraph, insert the following. Further information on the Canadian River and floodplain in the Norman area is available in a report by Gryzbowski (1980).

Page 6-50, paragraph 1, line 2. Replace as a warm-water fishery with the following: for "Fish and Wildlife Propagation". The definition of this use is "water used by wildlife for consumption, and which will support, sustain, and allow for the propagation of a warm-water fishery".

Page 6-50, paragraph 3, line 6. Change the last sentence to read: Migratory shorebirds gather around ponds to feed on macroinvertebrates (e.g. sandpipers and plovers) or fish (e.g. herons and egrets).

Page 6-50, paragraph 4, line 6. After the sentence ending "for a variety of animals" insert the following. Lake Thunderbird provides a good habitat for waterfowl, most of which feed on benthic vegetation.

Page 6-51, line 4. Replace the last sentence of the paragraph with the following. In recent years, bald eagles have been observed at Lake Thunderbird every winter, with as many as ten individuals observed in some years (Gryzbowski, 1982). A bald eagle was also sighted on the Canadian River in Cleveland County in January, 1982 (Moser, 1982).

Page 6-54, paragraph 3. Replace the first sentence with the following. Human entry into central Oklahoma probably occurred at least 11,000 years ago, and possibly as early as 20,000 years ago, as Paleo-Indian hunter-gatherers.

Page 6-55, paragraph 3, line 3. After the sentence ending "may be encountered", insert the following. As soon as the alignments are known, the Oklahoma Archaeological Survey should be notified so that they may perform an archaeological reconnaissance.

Page 6-55. Add the following paragraph to the end of section 6.5.3. Additional sewerage facilities will facilitate urbanization, thus increasing the potential that new housing construction might damage or destroy archaeological and historical resources. This impact can be mitigated by surveying areas into which development is expected, in order to identify archaeological and historical resources. Such resources would then be studied and/or protected. At this time, there are no regulations or other provisions to ensure such mitigation.

Page 9-3. Between Frazier, 1981 and Hall et al., 1977, insert the following references.

Gryzbowski, Joseph A., 1980. The Canadian River and floodplain in Norman, Oklahoma: Environmental perspective. Prepared for the Norman Environmental Control Advisory Board, Norman, Oklahoma.

Gryzbowski, Joseph A., 1982. Letter addressed to Presley Hatcher, U.S. Environmental Protection Agency. 8 September 1982, Norman, Oklahoma.

Page 9-5. Between PSC, 1982 and Roach, 1974, insert the following reference.

PSC, 1982a. Responses to EPA comment letter dated August 17, 1982 concerning the draft facility plan, city of Norman, Oklahoma, EPA grant no. C-40-0889-01. Painter & Spitz Consultants Inc., Oklahoma City, Oklahoma.

Page 9-5. Between Roach, 1974 and SCS, 1979, insert the following reference.

Schrempp, Tom, 1983. Personal communication. Painter & Spitz Consultants Inc., Oklahoma City, Oklahoma.

Page A-10, paragraph 2, lines 5 and 6. Delete the words per month so that the phrase reads with minimum capacity of 1000 gallons.

Page A-10, paragraph 3, line 1. Replace 60 with 46.

B. PAGE REVISIONS

This section presents the pages of the Draft EIS which have been substantially modified. The original page number for each of the revised or new pages is given in parentheses following the Final EIS page number. In the case of the revised "Impacts of Sludge Management Alternatives", only that portion of the page pertaining to sludge has been reprinted. The Draft EIS page(s) and the section heading are given before the revised section. Except for entirely new pages, the portion of the page containing changes is indicated by a heavy line in the left margin. A revision of figure 5-5 is contained within Section 5.4 (page III-7); reproductions of three other figures are presented at the end of this section.

pathogens, and many other contaminants. This alternative would reduce the discharge to the river, which would reduce the potential of the river to provide beneficial uses that relate to quantity. On the other hand, quality impacts of wastewater discharge would be eliminated if land application is implemented. Public input indicates a desire to utilize land application, if feasible.

The land application alternative would require 3930 acres of land to treat all of Norman's design-year sewage. Possible sites for land application had been evaluated in a report by Engineering Enterprise, Inc. (EE, 1974); a site south of the treatment plant, within the corporate limits of Goldsby, was recommended. Review by the facilities plan engineers determined that this was indeed the only practical site. Most of Norman is in the Little River watershed, where wastewater discharge is prohibited. The only other area of adequate size is the Ten-Mile Flats area in west Norman. Most of this land is within the 100-year floodplain and therefore unacceptable for wastewater disposal. Furthermore, land prices in that area are high. (It was determined that the city would have to purchase land, because long-term contracts from farmers for the use of wastewater could not be obtained.)

Based on the facilities plan, there are many practical problems with the land application alternative. Use of the Goldsby site would displace numerous residences. Ponds used to store wastewater during cool or rainy periods would represent a potential odor source. Land application would be very expensive; this expense would be due primarily to construction costs for the pipeline and the storage ponds, and so would be high regardless of the site chosen. For these reasons, land application does not appear to be a viable alternative.

5.3.3 Alternatives for Plant Location

Alternatives to the existing location of the treatment plant were considered in the initial screening phase of the facilities plan. Any other site must still be within the Canadian River basin, since wastewater discharge is prohibited in the Little River basin. Locations upstream of the existing plant would require that wastewater be pumped; this would be expensive and energy-intensive. Downstream of the existing site, there is little area within the city limits. The main advantage to relocating the plant downstream would be to facilitate service to additional areas in Norman; however, the additional area thus served would be small. Futhermore, a new plant location would not make use of existing facilities at the treatment plant, and so would be more expensive. For these reasons, alternative plant locations were screened out.

5.4 ALTERNATIVES FOR SLUDGE MANAGEMENT

Sludge (residual solid material) is a major product of wastewater treatment. Sludge is a rich organic material that, prior to treatment, contains significant amounts of pathogens (disease-causing organisms), nitrates, and heavy metals (especially if much industry discharges to the treatment plant). If improperly treated and disposed of, sludge can be the source of problems such as odors, ground-water contamination, and gastrointestinal disease. On the other hand, if properly managed, sludge can be a valuable resource. It is a good soil conditioner and has some fertilizer value. Alternatively its energy content can be captured and used to create steam or electricity. Thus, a primary purpose of facilities planning is to determine the best methods for: a) treatment to stabilize the sludge (that is, to reduce pathogens and odors); and b) disposal or reuse of this material in an environmentally sound manner.

Presently, sludge from the Norman treatment plant is treated and disposed in two separate ways. Primary sludge (solids which settle out in the primary clarifiers) is thickened and then sent to anaerobic digesters for stabilization. The digested sludge is disposed by wet injection on sites to the north and south of the treatment plant. Some of these sites are within the 100-year floodplain, and therefore do not meet EPA regulations for sludge disposal (40 CFR 257). Secondary sludge (from the intermediate and final clarifiers) is treated in aerobic digesters, dewatered on sludge drying beds and then sold to the public for use as a soil conditioner. This practice is not acceptable under current EPA regulations because of possible hazards due to pathogens and heavy metals in the sludge. The aerobic digesters do not function well, and so secondary sludge is sometimes mixed with primary sludge in the anaerobic digesters.

Currently under evaluation is the possibility of mixing Norman's sludge with soil and using the mixture to "cap" the city's landfill. This would occur only over the next 3 to 5 years, and does not provide a long-term solution for sludge disposal.

Development of alternatives. As is clear from the above-mentioned problems, neither the present treatment nor disposal facilities will be adequate for future management of Norman's sludge, and so it was necessary for the facilities plan to develop alternatives for new facilities. There are many options for each potential step of sludge management (thickening, stabilization, dewatering, further treatment, disposal) and the possible combinations are numerous. Specific alternatives most suitable to conditions in Norman were developed by the facilities plan engineers. All alternatives include thickening of the sludge as a first step. If bio-disc treatment is selected for wastewater treatment, gravity thickening would be used; for activated sludge alternatives, thickening would be by air flotation. Alternatives for further treatment and disposal are as follows.

A. One-half of the sludge to be treated by anaerobic digestion, one-half to be treated by lime stabilization; during 75% of the year, disposal by wet injection on private farmland; during 25% of the year, dewatering on vacuum coil filters, stockpiled until land available for disposal, then disked into the soil.

B. All sludge to be treated by anaerobic digestion; disposal same as for alternative A.

C. Dewatering by vacuum coil filters; resulting material mixed with municipal refuse and incinerated (codisposal); use heat to produce both steam and electricity (cogeneration); ash disposed of to landfill.

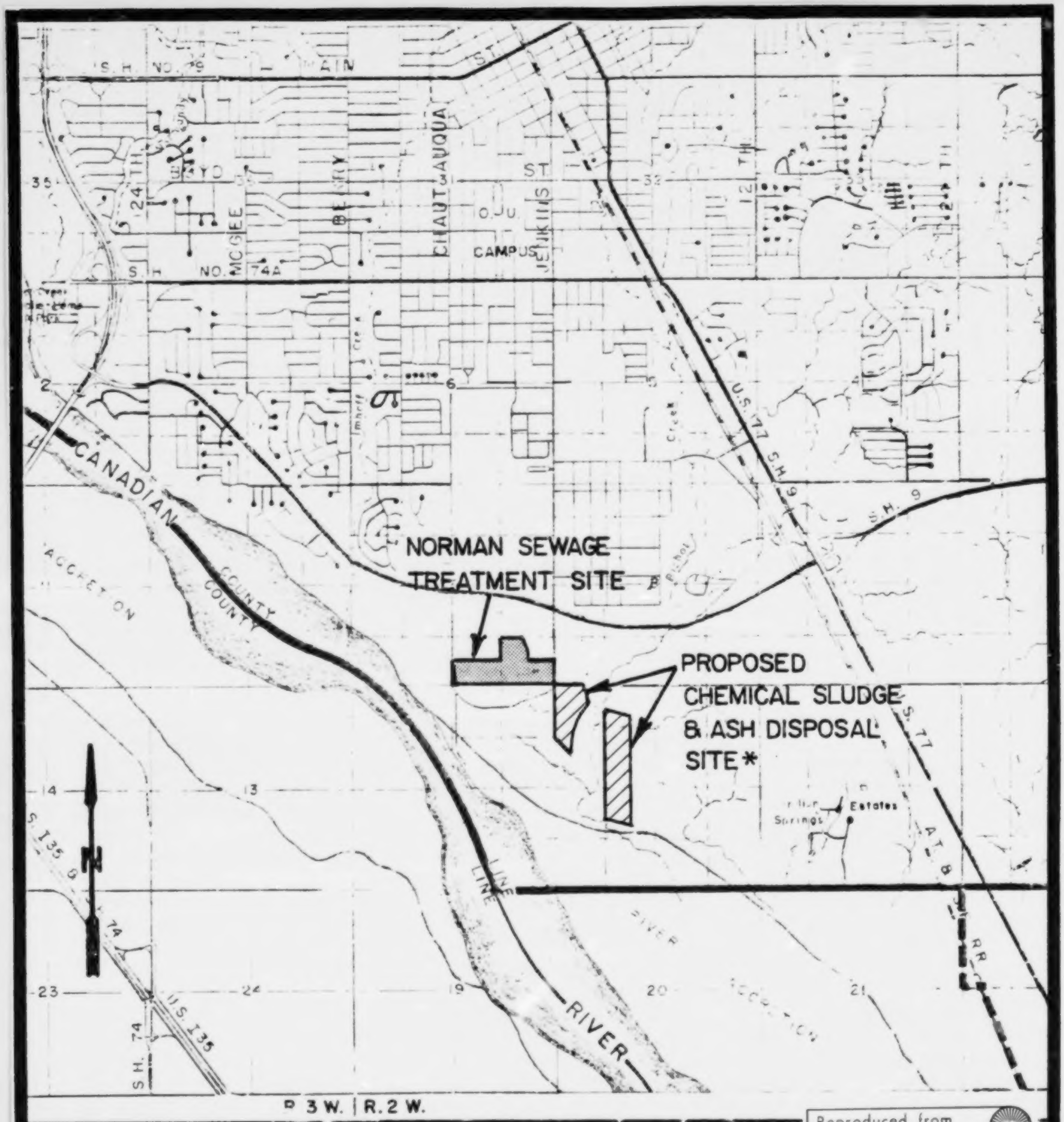
Unlike the wastewater treatment options, selection of the preferred sludge management alternative has engendered controversy. Thus, it is appropriate to explain the alternatives in some detail.

Alternatives A and B would each retain use of the plant's existing anaerobic digesters; additionally, alternative B would require new anaerobic digesters, whereas alternative A would require new equipment for the lime stabilization process. Both alternatives would dispose of the sludge by land application; the city would contract with private individuals who would utilize the sludge as a soil conditioner/fertilizer for crops or pasture. [OSDH regulations have recently been changed to allow for sludge disposal on private lands.] For approximately 75 percent of the year, wet sludge could be injected into the soil, as this process does not disturb growing crops. For approximately 25 percent of the year, inclement weather would prevent immediate disposal of the sludge; during such periods, the sludge would be dewatered to a dry cake and stockpiled at the treatment plant until land is available for its disposal (dry sludge must disked into the soil, and so can be applied only between crop plantings).

Alternative C (codisposal/cogeneration) would dispose of the sludge by incineration, instead of land application. The sludge would be mixed with municipal refuse prior to incineration; this enables the recovery of heat, with a net energy gain, and possibly qualifies the alternative as innovative technology, eligible for a higher percentage of EPA funding. Ash from the codisposal alternative would be disposed of by landfill; the proposed site for this landfill is directly southeast of the treatment plant, on either side of Bishop Creek (see figure 5-5).

All alternatives include dewatering of the sludge to a dry cake, using vacuum coil filters. Such dewatering is necessary for the codisposal alternative, in order for the sludge to burn properly. In the case of alternatives A and B, dewatering would be necessary only 25 percent of the year; alternative B would require smaller coil filters than alternative A, because anaerobic digestion reduces the solids content of the sludge. Sludge is somewhat resistant to dewatering; in order to achieve the desired solids content (20 to 25 percent) it is necessary to condition the sludge prior to dewatering. This can be by addition of one or more chemicals, such as lime, polymers, and ferric chloride. Note that alternative A utilizes a separate lime conditioning step to stabilize the sludge (that is, to significantly reduce pathogens and halts odor production); thus, this alternative would consume more lime than the other alternatives, and lime conditioning would be included even when the sludge was not to be dewatered.

The above alternatives are for treatment of the sludge which would result from level A wastewater treatment (see section 5.3). If level D treatment is required, there would be additional lime sludge from the solids contact


S.H. NO. 9
MAIN ST
CHAUTAUQUA
JENKINS
ST
O.U. CAMPUS
BERRY
MCGEE
24TH
12TH
S.H. NO. 74A
U.S. 77 S.H. 9
S.H. 9
CANADIAN
COUNTY
COUNTY
LINE
RIVER
ACCRETION
RIVER ACCRETION
NORMAN SEWAGE TREATMENT SITE
PROPOSED CHEMICAL SLUDGE & ASH DISPOSAL SITE*
Estates
Springs
A.T. & S.F. RR
U.S. 77
I.S. 135
U.S. 135
S.H. 74
N
35
32
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R. 3 W.
R. 2 W.

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*LEVEL D CODISPOSAL/COGENERATION OPTIONS ONLY

FIGURE 5-5
SLUDGE DISPOSAL

Source: PSC, 1981

units. This would be stored for several years in decant ponds; then the dewatered "chemical sludge" would be disposed of at a landfill site (see figure 5-5). There would also be some additional sludge from the nitrification basins; the amount would be very small and the capacity planned for level A treatment should also accommodate this nitrification sludge.

Tradeoff analysis. Costs for the various alternatives are presented in table 5-6. Alternative A has the lowest capital cost, but has a relatively high operation and maintenance cost, and so has a total present worth higher than alternative B. For alternative C, both "total" and "sludge portion" costs are shown. The sludge portion cost is calculated using the EPA-prescribed Alternative Justifiable Expenditure Method. Only this amount is potentially eligible for EPA funding. The remainder of the total cost (representing the municipal refuse portion) would be funded by the city. Note that all alternatives have the potential of off-setting costs by utilization of energy from the sludge.

Apart from costs, each of the three alternatives presents both advantages and disadvantages. The tradeoff analysis weighs these factors against each other in order to determine the applicant's preferred approach to sludge management. The analysis was much more detailed than for wastewater treatment alternatives, because factors other than treatment economics here play major roles in the decision-making process.

The three alternatives were ranked on their relative costs and benefits according to a number of criteria, similar to (but more detailed than) the approach used for wastewater treatment alternatives. The results are summarized in table 5-7. This table incorporates engineering evaluations from the facilities plan plus environmental considerations. Total points for each alternative are given, with a lower score indicating a "better" alternative. However, note that the criteria are not weighted; that is, each factor is treated with equal importance by the rating scheme. Should public opinion consider a particular criterion to have overwhelming importance, an alternative which meets that criterion might be favored, even if it has a higher total point score on table 5-7.

The criteria used to evaluate the alternatives can be divided into four categories (with some overlap). Category one is resource use, that is, the amount of money, energy, labor, materials, and real estate that a given sludge handling and disposal system consumes. Alternatives A and B both use energy to heat the digesters, to operate the dewatering equipment, to transport sludge to the disposal site and to inject the sludge. The energy usage is higher for A because of the lime stabilization process. Alternative C requires a great amount of energy in the form of fuel to incinerate the sludge/refuse mixture. All alternatives would use some lime and ferric chloride to condition the sludge for dewatering. Alternative C would require dewatering of all sludge, and thus its chemical usage would be four times that of alternative B, which would dewater only one-quarter of the sludge. In addition to dewatering one-quarter of the sludge, alternative A would consume large amounts of lime for the stabilization process.

TABLE 5-6. SUMMARY OF COSTS OF SLUDGE MANAGEMENT ALTERNATIVES.

For each sludge management alternative, costs are given for treatment/disposal of sludge from wastewater treatment to level A and to level D.

	Total Capital Cost	Annual O&M	Annual Revenue	Total Present Worth
A. Anaerobic Digestion and Lime Conditioning; Land Application				
Level A	1,990,000	315,959	a/	$ 5,241,850
Level D	2,575,094	515,459	a/	$ 7,880,198
B. Anaerobic Digestion; Land Application				
Level A	3,052,000	210,343	a/	$ 5,216,850
Level D	2,575,094	515,459	a/	$ 7,855,198
C. Codisposal/Cogeneration				
Level A				
total b/	8,379,000	824,920	d/	$16,869,077
sludge portion c/	4,057,830	416,694	d/	$ 8,346,440
Level D				
total b/	9,129,000	954,920	d/	$18,957,037
sludge portion c/	4,807,830	546,694	d/	$10,434,400

a. Possibly some cost recovery from methane combustion and/or sale of sludge to farmers.
b. Costs for entire facility, including municipal refuse tipping floor.
c. Portion of the cost which is potentially grant-eligible under the wastewater facilities construction grant; calculated using the "Alternative Justifiable Expenditure Method for Cost Analysis, with Alternative B as the Single Purpose Cost of Sludge Disposal.
d. Possibly some revenue from heat recovery -- sale of steam and/or electricity.

Sources: PSC, 1981; PSC, 1982a; Schrempp, 1983.

TABLE 5-7. COMPARISON OF SLUDGE MANAGEMENT ALTERNATIVES.

Rankings of 1 (best) to 3 (least desirable) are accompanied by quantification of impact which is associated with rating.

		ALTERNATIVE A 50% anaerobic digestion, 50% lime stabilization; land application		ALTERNATIVE B anaerobic digestion land application		ALTERNATIVE C codisposal cogeneration
A. RESOURCE USE						
Dollar Costs (Total Present Worth)	2	Level A: $5,241,850 Level D: $7,880,198	1	Level A: $5,216,850 Level D: $7,855,198	3	(sludge portion only) Level A: $8,346,440 Level D: $10,434,400
Energy Use (Equivalent Million BTU/yr)	2	3117	1	1577	3	18,580
Chemical Use	2	637 tons/ yr of lime 102 tons/yr of ferric chloride	1	269 tons/yr of lime 81 tons/yr of ferric chloride	3	About 4 times as much as alt. B
20-year Land Requirements	3	Use of private land Level A: 312 acres Level D: 860 acres	2	Use of private land Level A: 240 acres Level D: 781 acres	1	City-owned land Level A: 20 acres Level D: 80 acres
SUBTOTAL	9		5		10	
B. RESOURCE RECOVERY						
Energy Production	3	Potential to recover energy from anaerobic digestion methane	2	As alt. A, but quantity of methane would be double	1	Potential to recover heat to generate electricity and steam
Fertilizer Value	1	Nutrients retained; lime treatment is good for OK soils	2	Nutrients retained; humic content reduced by digestion	3	None
Cost Recovery Potential	2	In future, may be able to sell sludge	3	Potential less than alt. A since no lime stabilization to help disinfect	1	Can sell electricity; also steam if a customer is identified
SUBTOTAL	6		7		5	

Table 5-7. Continued.

		ALTERNATIVE A 50% anaerobic digestion, 50% lime stabilization; land application		ALTERNATIVE B anaerobic digestion land application		ALTERNATIVE C codisposal cogeneration
C. OPERATION						
Ease of Implementation	2	Relatively easy. Uses some existing facilities	1	Easiest to construct and to modify if necessary	3	Requires building of complex facility; change in refuse operation; new ordinances
Ease and Flexibility of Equipment Operation	2	Lime feed process which is new to operators	1	Operators already familiar with anaerobic digestion	3	Relatively sophisticated equipment; must coordinate w/ refuse division
Process Control (reliability)	1	Good control with lime feed; digestion portion is a biological process subject to upsets	2	Biological process, subject to upsets	3	May be difficulty in proportioning sludge & refuse; subject to breakdown if fed improper refuse
Safety	2	Little danger from process; does involve use of caustic lime	1	As alt. A; less use of lime	3	High temperatures, high voltages, steam, electrical equipment
SUBTOTAL	7		5		12	
D. IMPACTS						
Odor Potential	3	Primary potential from digestors; lime sludge produces ammonia	2	Primary potential from digestors	1	No odor from incineration
Bacteria/Viral Safety	2	As alt. B, but pathogens significantly reduced by lime process	3	Slight potential hazard to workers at disposal sites	1	All pathogens destroyed by incineration
Air Quality Impacts	2	Requires scrubbing of ammonia from lime stabilization process	1	Minimal	3	Possible problems; scrubbers would would be required
Potential for Ground Water Pollution	1	Slight: nutrients utilized by crops; lime immobilizes metals	2	As alt. A., but less lime	3	Some potential from ash disposal site
Public Acceptance	2	Involves some new and thus uncertain technology	1	Much like present system, which public approves of	3	High capital cost; complex technology; not cost-effective for refuse
SUBTOTAL	10		9		11	
TOTAL RATING	32		27		37	

Sources: PSC, 1981; LWA, 1982; PSC 1982a; Schrempp, 1983.

Alternatives A and B require large amounts of land for the disposal of sludge; however, it can be private land used by contract. Alternative B uses somewhat less land because the anaerobic digestion process reduces solids content of the sludge. Alternative C requires only a few acres for the disposal of ash; the city would have to purchase this land.

Balancing resource use is the potential of resource recovery. Sludge-related resources include: methane gas, which can be burned to heat digesters or to generate energy for operation of the treatment plant; the sludge itself, used directly a fertilizer and soil conditioner; and energy from burning the sludge to generate heat, electricity, and/or steam.

For alternatives A and B, the final sludge product is an organic material which has some fertilizer value and is a good soil conditioner. Sludge applications improve soil properties such as humus content, fertility, water-holding capacity, cation-exchange capacity, and soil aggregation. Nitrogen and phosphorus generally make up 2-3 percent of a typical municipal sludge, which in itself does not make the material a complete fertilizer. However, the nutrients are in the organic form and are released to the soil slowly, which is an ideal trait for a soil conditioner. There are some hazards associated with sludge application: potential leaching of nitrates from the application site into the ground water; build-up of heavy metals (especially cadmium) in the soil and in vegetation grown at the site; potential bacterial or viral infection of persons who come into contact with the sludge.

Alternatives A and B take advantage of sludge's fertilizing and conditioning properties by applying the sludge to land where it can then be utilized by crops. At present, the sludge would be given to the farmers who allow disposal of it on their land. In the future, as the cost of pertroleum-based fertilizers rises, it is conceivable that the city could sell the liquid sludge. It is also possible that the city could bag and sell the dewatered portion of the sludge. Under present EPA regulations (40 CFR 257), the sludge could not be sold until testing indicates that pathogen levels were sufficiently reduced; alternative A has an advantage in that the lime-stabilzation process significantly reduces pathogens.

Alternative C involves incineration of the sludge, which would destroy its fertilizer value. On the other hand, the energy content of the sludge, which is released as heat during incineration, can be recovered and used to generate steam and/or electricity. The heat recovery is enhanced by incinerating the sludge with municipal refuse (the mixture burns more efficiently than sludge alone). The electricity produced could supply the needs of the treatment plant and additionally could be sold to utilities; potentially the revenue thus generated could more than cover the operation and maintenance costs for the incineration facility. If a steam customer were to be identified, even more revenue could be generated.

Some energy recovery is also possible from alternatives A and B, in the form of methane from the anaerobic digesters. The amount of recoverable methane would be greater under alternative B, since all sludge would be digested. Dollar worth of the potential heat and electricity from methane combustion was not evaluated in the facilities plan. Methane probably would provide at least enough energy to heat the digesters, and perhaps energy in excess; however, impurities in sludge gas result in expensive maintenance of the methane burning equipment, and so this option was not regarded as cost-effective.

Regarding resource recovery: Alternative C has a good rating because of the large potential revenues from electricity and steam production. Alternatives A and B utilize the organic value of sludge, and could potentially provide energy due to methane production. Alternative A has the best rating because the lime used for stabilization enhances the value of the sludge.

The third category of evaluation factors given in table 5-7 deals with the operation of the sludge facilities. "Ease of implementation" refers to the amount of effort required to get the sludge management system in operation. Alternatives B would be the easiest alternative to implement in phases, since anaerobic digestion is already used at the plant, the existing sludge drying beds could be used in the immediate future, and dewatering equipment added later. Alternative A is somewhat more complex, requiring the installation of lime stabilization equipment. Alternative C is the most difficult to implement because it requires building a large, complex incineration facility, which can not be built in phases. Much of the funding for this facility would not be eligible under an EPA construction grant. Ordinances restricting the type of refuse the city can handle must be passed, and the public must be educated to conform to the restrictions. Also, the sanitation department must be coordinated with the sewage department.

Alternative C generally presents greater problems in operation, because it involves sophisticated technology; the system is also subject to breakdown if the wrong type of refuse is fed in. Alternative B uses a process which is familiar to the existing staff; however, the anaerobic digestion process is subject to upsets which may be outside operator control (e.g. if a slug of toxic material discharges to the system). The anaerobic digestion portion of alternative A has advantages and disadvantages like those of alternative B. The lime stabilzation process is a new technology for the staff to learn, but it has the advantage of greater process control.

The fourth evaluation category reflects various environmental impacts. Sludge is one of the greatest sources of odor at a treatment plant, and therefore the alternative selected has ramifications for the overall public acceptability of the treatment plant. Alternative C is given the best ranking because the incineration process should not produce significant odors. Alternatives A and B have the potential to produce objectionable odors if the anaerobic digestion process is upset. Alternative A also produces ammonia from the lime stabilization process; potential odors would be controlled by scrubbing. Alternatives A and B have some potential for odors from disposal sites, but the sites would be scattered in rural areas; additionally, the sludge would be incorporated into the soil, which would restrict the odor potential.

Land application of sludge can have adverse impacts on ground water due to leaching of nitrate from the disposal site. There is also danger of heavy metals accumulating in the soil to toxic levels; cadmium is of special concern. The land application rate for sludge proposed in the facilities plan is designed to avoid these problems. Appendix 7 of that document presents calculations which show that, based on sludge cadmium concentrations and the sludge application rate, cadmium levels would not accumulate in the soil to levels beyond that allowed by EPA regulations. The application rate is also designed to provide no more nitrogen than would be taken up by crops grown on the site. Sludge disposal is permitted by the Oklahoma State Department of Health; they would review the final land application and monitoring design for adequacy of environmental protection.

Alternative C has only a small potential for ground-water pollution, from the ash disposal site. The ash landfill would be constructed and operated to avoid any such problem, and the disposal design must be approved by the Department of Health prior to implementation. On the other hand, this alternative has the potential for adverse impacts on Norman's air quality. The major air pollutant from sludge incineration is particulate matter, which must be removed by some type of pollution control equipment. If improperly handled during disposal, incineration ash can also cause particulate pollution. Other emmissions include sulfur dioxide, nitrogen oxides, hydrocarbons, and hydrogen chloride gas. Depending on the quality of the wastewater, sludge incineration emmissions may also contain toxic metal and organic compounds. Because of the much greater volume of material incinerated under the codisposal alternative, it has the greatest potential to contribute to air quality problems. See section 6.3.5 for further discussion of air quality impacts of incineration.

Another environmental impact of concern with sludge disposal is bacteria and viruses in the sludge which have the possibility to cause disease if the public comes in contact with the sludge (this danger decreases with time, since the pathogens eventually die off). Alternative C would eliminate this problem by incineration of the sludge, but there would be a potential hazard with alternatives A and B. Exposure should be minimal, since the land used would be private property. Alternative A is rated better than B because lime conditioning can destroy a significant amount of pathogens.

Public acceptance is included in this section, since to choose an unpopular alternative would presumably have a negative impact on people's perception of their environment. Public comment indicates opposition to alternative C because of its high capital costs and complex technology, and because incineration of municipal refuse is not favored. Alternative B is favored because it is easiest to implement, could most easily be modified if a different sludge management system became desirable in the future, and is the lowest cost alternative.

The total ratings in table 5-7, based on simple addition of all individual ratings, indicate that alternative B is preferrable, followed by A and then C. The favorable rating for alternative B reflects its low cost, simple technology, ease of implementation, and acceptability to the public. The city of Norman has chosen alternative B as their preferred alternative.

Alternative A is similar to alternative B, and has the further advantage of greater process control with the lime stabilization system. The lime stabilzation also improves the value of the sludge by destroying pathogens and by including a desirable chemical for soil conditioning. These advantages are offset by higher O&M costs, higher use of energy and chemicals, and less ease of implementation than alternative B.

Alternative C is attractive in these energy-conscious times because it actually would produce more energy than it consumes. There is a potential for large amounts of revenue from electricity production (and from steam, if a customer were identified). But this alternative has a high capital cost, only part of which is potentially elegible for EPA funding. It uses a complex and sophisticated technology to which the public has indicated opposition. Also, even if alternative C is cost-effective for sludge disposal, it is not necessarily cost-effective for refuse disposal. Currently, the cost for refuse disposal in Norman is about $4/ton; the projected cost under the codisposal alternative would be $12/ton, a three-fold increase.

5.5 OTHER ALTERNATIVES

The development of a complete wastewater management system requires consideration of many factors beyond basic treatment concepts. This section discusses methods for addressing the remaining components of an effective facilities plan (keeping in mind that the plan, like the EIS, is a draft document subject to revision). For many components the planning effort developed a single 'most effective' approach, because of the general need to provide the best practicable treatment works in Norman.

5.5.1 On-Site Systems; Septage Disposal

Individual liquid waste disposal systems (on-site systems, or OSS) may constitute a nonpoint source of pollution. The ACOG 208 reports estimated 1,000 OSS within Norman's corporate limits, 90 percent in the Lake Thunderbird watershed (ACOG, 1977e). Central Oklahoma Master Conservancy District records indicated over 5,000 systems by 1982 for the entire Lake Thunderbird watershed, including Norman, Moore, Oklahoma City, and unincorporated areas (Brown, 1982). At present, septage (septic tank pumpings) is disposed of at the Norman wastewater treatment plant or at other treatment plants in the area.

Nearly all OSS in the area are single-chambered septic tanks with tile drainfields. Installation of OSS is subject to Oklahoma State Department of Health (OSDH) rules and regulations (table A-2) and to municipal and county

Draft EIS pp. 6-7 and 6-8 -- EARTH RESOURCES:

6.1.5 Impacts of Sludge Management Alternatives

All of the sludge disposal alternatives require some land. Alternatives A and B require from 240 acres (level A) to 860 acres (level D) for land application of sludge. At level D, an additional 60 acres would be required for disposal of chemical sludge. Potential wind erosion from mechanical disturbance of the soil would be minimized by the annual rainfall of 34 inches per year, by crops or pasture grown at the sites, and by the fact that sludge applications would increase soil moisture and lead to greater soil aggregation.

As discussed in section 5.4, sludge is a good soil conditioner and has some fertilizer value. Therefore, sludge application should have a positive impact on the soil, such as improving its texture, water-retention, and ion-exchange properties. However, there is some possibility that heavy metals (especially cadmium) from the sludge might build up to levels that are toxic either to plants or to the higher food chain. For this reason, EPA regulations (40 CFR 257) require that the disposal area not be used in the future for growing food-chain crops. Heavy metal content in sludge varies according to the industries discharging to the treatment plant. Since Norman has little industry, heavy metal buildup may not be a problem; additionally, Norman is in the process of implementing an industrial wastewater pretreatment program. The facilities plan includes calculations that indicate cadmium levels will not build to unacceptable levels with the proposed application rate. Those calculations were based on an application rate of 10 tons/acre/year; the preferred alternative would use an application rate of only 8 tons/acre/year.

The codisposal alternative calls for use of 20 acres over the 20-year planning period for ash disposal. With level D treatment, an additional 60 acres would be required for disposal of chemical sludge. Unavoidable, long-term impacts which would result from this practice are those associated with a normal landfill operation.

Draft EIS pp. 6-37 and 6-38 -- WATER RESOURCES:

6.2.8 Impacts of Sludge Management Alternatives

A basic concern with land application of sludge (alternatives A and B) is that contaminants might leach out of the sludge and into the underlying ground water. The contaminant of greatest concern is nitrate, which is a health hazard when present at high levels in drinking water. Sludge contains large amounts of nitrogen which may oxidize to nitrate when applied to the ground. Nitrate is very soluble in water, and so is easily transported down to the water table. Under the preferred alternative, the sludge would be applied to crop or pasture land; the vegetation would utilize nitrogen, thus reducing the amount of nitrate available to seep into the ground water.

Runoff from the land application sites could carry pathogens, nutrients and other pollutants from sludge into the South Canadian River. Such problems would be minimal due to the fact that the sludge will be incorporated into the soil, and that vegetation will be grown at the sites. If warranted, the disposal contract could include requirements for erosion control measures such as contour tilling.

The incineration alternative (C) would produce an ash relatively rich in metals which could leach into the ground water at the landfill site; this problem would be minimized because the ash is also alkaline, which reduces the solubility of metals. Runoff from the ash and chemical sludge disposal site could carry pollutants into Bishop Creek. The landfill would need to be designed and operated to minimize ground water contamination and runoff; monitoring wells would be installed at the site.

The sludge disposal plan must be approved by the Oklahoma State Department of Health; they may require measures such as monitoring wells, specific stipulations in the disposal contracts, and so forth.

Flood hazard areas. All proposed sludge treatment and disposal facilities are located outside of the 100-year flood plain (see figures 5-4 and 6-2).

Draft EIS pp. 6-45 to 6-47 -- AIR QUALITY: ODOR: NOISE:

6.3.5 Impacts of Sludge Management Alternatives

Air quality. Alternatives A and B call for trucking the sludge to the disposal site. Emissions from the trucks and disposal equipment would contribute a negligible amount of air pollutants to the vicinity. Both these alternatives call for anaerobic digestion which produces methane, hydrogen sulfide and other gases. Disposal of the digester gas is by combustion, which produces nitrogen oxides, particulates, carbon monoxide, hydrocarbons, and sulfur dioxide. However, the quantity of such emissions would be negligible compared to the total pollutant burden in the planning area. Disturbance of soil at the land application site could result in increased dust from the site; this would be minimized by vegetative cover (see section 6.1.5).

Alternative C involves incineration, and thus has a potential to adversely impact Norman's air quality. Pollution control equipment, such as scrubbers, would be required in order for the incineration process to meet air quality regulations. Table 6-12 lists quantities of sludge incineration emissions, before and after scrubbing, for particulates, sulfur dioxide, carbon monoxide, nitrogen oxides, hydrocarbons, and hydrogen chloride gas. Metals (such as mercury), pesticides, PCB's, and other persistent organics may also be present in incineration emissions; their concentrations would depend primarily on the amount and type of industries contributing to the wastewater and municipal refuse streams, and they should not be significant in Norman.

Most of the above-listed contaminants should not be emitted at significantly high levels if the incinerator is properly designed (EPA, 1980; NRC, 1978). The pollutant of greatest concern is particulates; EPA has set standards concerning particulates from sludge incineration, as follows (EPA, 1980):

1. particulate emissions must be no more than 0.65 grams per kilogram of dry sludge input;
2. the emission plume must be of less than 20 percent opacity;
3. particulate collection equipment must have efficiencies of 96-97 percent.

A standard is also set for mercury emissions: no more than 3200 g/day of mercury may be released (EPA, 1977c).

With alternative C (codisposal) there might be short-lived emissions of excessive smoke, should rubber tires or oil get into the incinerator along with municipal refuse. For both incineration alternatives, dust control measures would need to be taken so that the residual ash from incineration would not become airborne during disposal.

Odors. Under alternative A or B, there is a potential for odors from the sludge disposal sites; however, as the sludge is to be incorporated into the soil, odors are not expected to be significant. There is also some potential for odors from the anaerobic digesters which would be used for either alternative; proper operation of the digesters would prevent objectionable odors. There would be no odor from alternative C if the incinerator is properly operated.

Noise. Alternatives A and B call for trucking the sludge to the disposal site and then using machinery to either inject or landfill the sludge. The trucks and machinery would create noise on the order of 70-80 dBA (at 50 feet). The truck noise (two round trips a day) would not effect a noticable increase in ambient noise levels. Noise at the disposal sites would be in addition to existing sources such as the noise levels from the interstate highway. The turbine that would be used along with alternative C (codisposal) would produce considerable noise. Presently, the proposed location for the cogenerator is at the existing plant site. This equipment would be enclosed in a building to reduce noise impact on the surrounding area. If this alternative is selected, it will be designed to conform to appropriate noise regulations.

Draft EIS p. 6-53 -- BIOLOGY:

6.4.6 Impacts of Sludge Management Alternatives

Sludge application (alternative A or B) would improve the ability of the soils to support vegetation. The incineration alternative (C) would require landfill of ash; 20 acres of vegetation and habitat would be disturbed over the 20-year period. If level D treatment is implemented, another 60 acres of land will be required for disposal of chemical sludge, no matter which sludge management alternative is implemented. Again, this would disturb vegetation and wildlife habitat at the landfill site.

Draft EIS p. 6-56 -- ARCHAEOLOGICAL AND HISTORICAL RESOURCES:

6.5.5 Impacts of Sludge Management Alternatives

Organics can leach from sludge treated soils into archaeological sites in the deeper soil; these organics can make interpretation of the data difficult. This impact can be mitigated by informing the State Archaeologist and the State Historic Preservation Officer as soon as sludge disposal sites are determined. If the land owners agree, the sites can be surveyed for archaeological and historic sites prior to sludge application.

No known archaeological sites exist within the area proposed for ash disposal from the codisposal alternative. If this alternative were selected, and any resources were discovered at the disposal site, use of the area would be halted until the cultural significance of the materials could be determined (see Part IV, Section B of this Final EIS).

Draft EIS p. 6-76 -- SOCIO-ECONOMICS AND LAND USE:

6.6.6 Impacts of Sludge Management Alternatives

Land requirements for each of the alternatives are set forth in table 6-19. Land needed under alternative A or B would be private lands utilized by contract between the city of Norman and the land owners. The land application alternative would enhance the long-term productivity of the land because of the organic matter and nutrients contained in the applied sludge. However, due to the possible buildup of toxic metals it would not be suitable for production of food-chain crops. The chemical and ash disposal site could not be used in the future for agriculture but could be developed for recreational or industrial use.

Adverse health effects could result from handling of wastes in the sludge disposal area. There is also a potential for odors from the land application

TABLE 6-19. LAND REQUIREMENTS FOR ALL ALTERNATIVES.

Land requirements are in addition to land utilized by the current treatment plant. For levels B and C, no land would be required in addition to that needed for level A.

Wastewater Treatment Alternatives	ACRES
Level A treatment	
Alternative 1 (jet activated sludge)	10
Alternative 2 (biofilter/jet activated sludge)	10
Alternative 3 (biofilter/conventional activated sludge)	0
Alternative 4 (biofilter/bio-discs)	0
Level D treatment	
Alternative 5 (biological nitrification)	10
Alternative 6 (breakpoint chlorination)	10
Alternative 7 (land application)	3,930
Sludge Management Alternatives	
Level A treatment	
Alternative A (lime conditioned sludge, land application)	312
Alternative B (anaerobic digestion, land application)	240
Alternative C (co-disposal)	20
Level D treatment [a]	
Alternative A (lime conditioned sludge, land application)	860
Alternative B (anaerobic digestion, land application)	781
Alternative C (co-disposal)	80

a. Includes 60 acres for disposal of chemical sludge.

Source: PSC, 1981; Schrempp, 1983.

sites. These potentials would be minimized, since the sludge would be incorporated into the soil and the sites would be private lands in relatively rural settings.

Draft EIS pp. 6-80 to 6-83 -- ENERGY AND OTHER RESOURCES:

6.7.5 Impacts of Sludge Management Alternatives

Table 6-21 provides information on energy requirements of the sludge treatment and disposal alternatives. Alternatives A and B would use diesel fuel for transportation and disposal of the treated sludge; the amount required would be somewhat less for alternative B, because anaerobic digestion reduces the quantity of solids, as compared to lime stabilization. The anaerobic digestors for alternative A or B require fuel for heating; this can be provided by burning the methane gas produced by the digestion process. Alternatives A and B would both require some electricity to run the vacuum coil filters; alternative A would additionally require electricity for the lime feed system. In total, alternative A would require about twice as much energy as alternative B -- 3,117 million BTU per year versus 1,577 million BTU per year.

The energy requirements of the land application alternatives are modest compared to codisposal. Alternative C would require large amounts of electricity to dewater all the sludge (only 25 percent of the sludge would be dewatered under alternative A or B). Large amounts of fuel would be required to incinerate the sludge and refuse mixture. On the other hand, codisposal has the potential to generate large amounts of energy (electricity and/or steam) by capturing the heat of incineration. Overall, codisposal could produce more energy than it consumes, for a net gain of 53,700 BTU per year. Although the land application alternatives would produce no electrical energy, note that land application to agricultural soils would contribute to crop growth and reduce energy used to produce a commensurate amount of chemical fertilizer.

Disposal of sludge from alternative A or B would be at the rate of 8 tons per acre per year. This translates to 312 acres under alternative A, 240 acres under alternative B. Alternative C would require only 1 acre per year for ash disposal, 20 acres over the planning period.

Chemical usage would consist of lime and ferric chloride used for lime stabilization and/or dewatering. Alternative A would use 637 tons of lime per year and 102 tons of ferric chloride. Alternative B would use 269 tons per year of lime and 81 tons of ferric chloride. Alternative C would require about four times as much lime and ferric chloride as alternative B.

TABLE 6-21. NET ENERGY REQUIREMENTS FOR THE SLUDGE MANAGEMENT ALTERNATIVES.

KWH/yr = kilowatt hours per year. BTU/yr = British thermal units per year.

	Alternative A Lime Condition/Digest Land Application		Alternative B Anaerobic Digestion Land Application		Alternative C Codisposal/Cogeneration of Steam & Electricity	
	Electricity KWH/yr	Fuel Million BTU/yr	Electricity KWH/yr	Fuel Million BTU/yr	Electricity KWH/yr	Fuel Million BTU/yr
A. ENERGY CONSUMPTION						
Sludge Treatment	396,600	a/	62,500	a/	177,000	17,220
Sludge Transportation	-	752	-	582	-	-
Sludge Disposal	-	1,012	-	782	-	-
Ash Disposal	-	0	-	0	-	760
TOTAL	396,600	1,764	62,500	1,364	177,000	17,980
TOTAL ENERGY CONSUMPTION b/ (equivalent million BTU/yr)		3,117		1,577		18,850
B. ENERGY PRODUCTION						
Power	-	-	-	-	7,884,000	-
Steam	-	-	-	-	-	45,380 c/
Total	0	0	0	0	7,884,000	45,380
TOTAL ENERGY PRODUCTION b/ (equivalent million BTU/yr)		0		0		72,280
C. NET ENERGY REQUIREMENT		3,117		1,577		- 53,700 d/

---

a. Fuel needed for heating of anaerobic digestors provided by burning methane gas from digestion process.
b. Total energy (fuel and electricity) in million BTU/yr, using conversion factor of 3,412 BTU/KWH.
c. Work produced, in equivalent million BTU/yr, not accounting for heating or other thermal conditioning processes.
d. Net energy produced (i.e., total energy production is greater than total energy consumption).

Sources: PSC, 1981; PSC, 1982a.

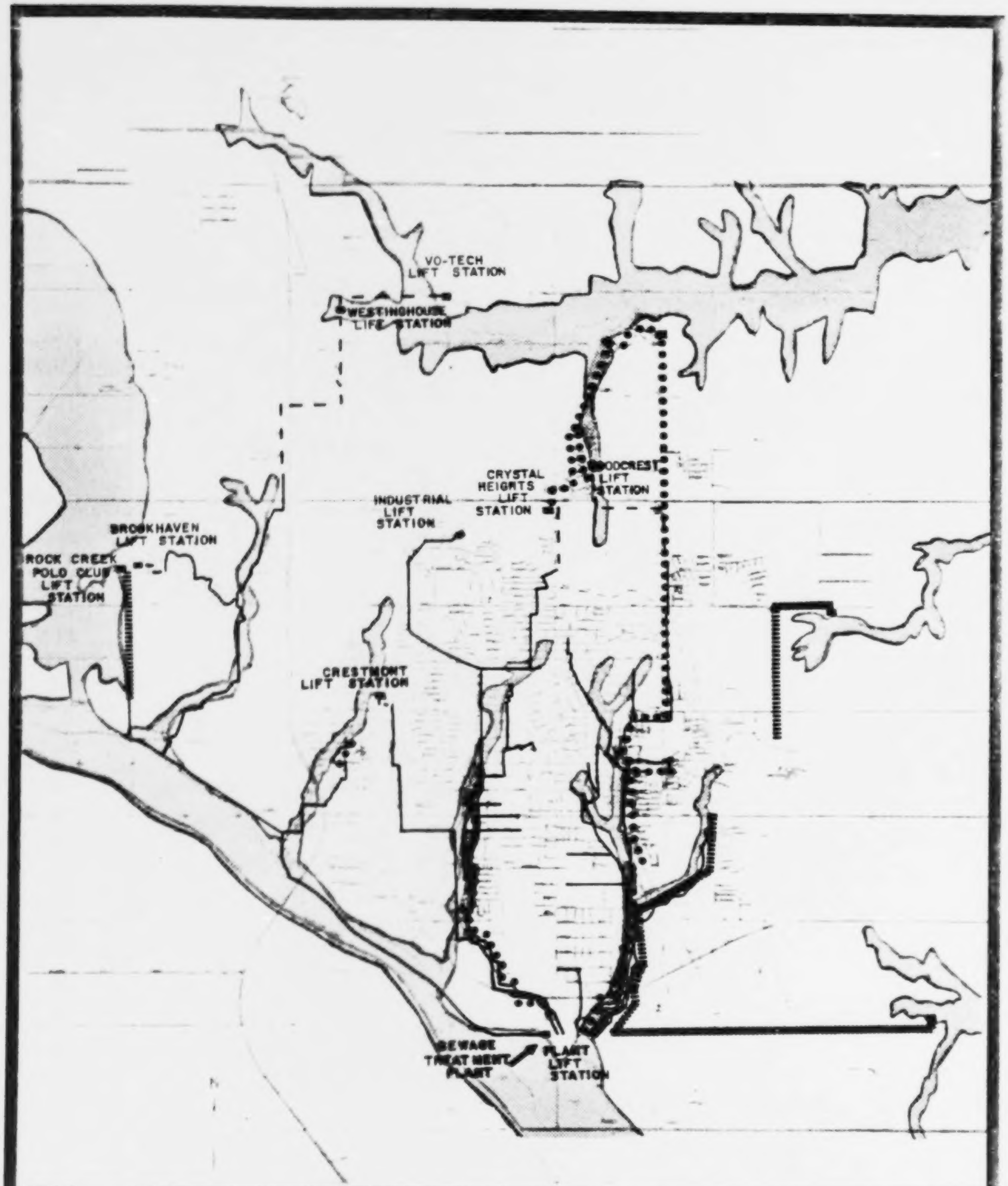
VO-TECH LIFT STATION
WESTINGHOUSE LIFE STATION
CRYSTAL HEIGHTS LIFT STATION
OODCREST LIFT STATION
INDUSTRIAL LIFT STATION
BROOKHAVEN LIFT STATION
ROCK CREEK POLO CLUB LIFT STATION
CRESTMONT LIFT STATION
SEWAGE TREATMENT PLANT
PLANT LIFT STATION
▨ 100-year floodplain
— Existing Interceptor
– – Existing Force Main
■ Lift Station
●●●● Initial line construction
▬ Future line construction

FIGURE 6-2. FLOOD HAZARD AREAS

Source: HUD, 1979.

Reproduced from
best available copy.

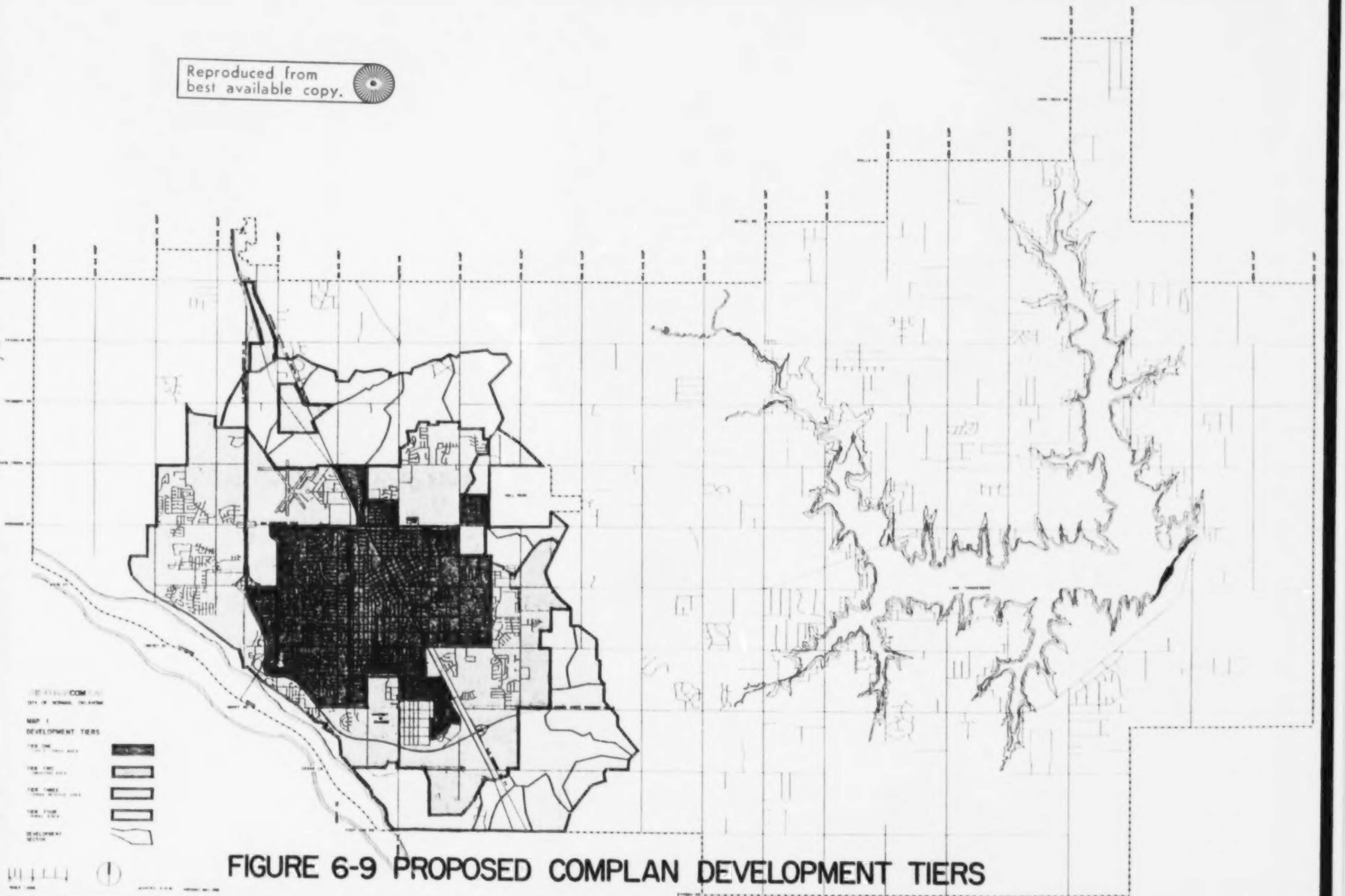
CITY OF NORMAN, OKLAHOMA
MAP 1
DEVELOPMENT TIERS
TIER ONE
TIER TWO
TIER THREE
TIER FOUR
DEVELOPMENT SECTOR

FIGURE 6-9 PROPOSED COMPLAN DEVELOPMENT TIERS

III 24
24 (Draft EIS p. 6-60)

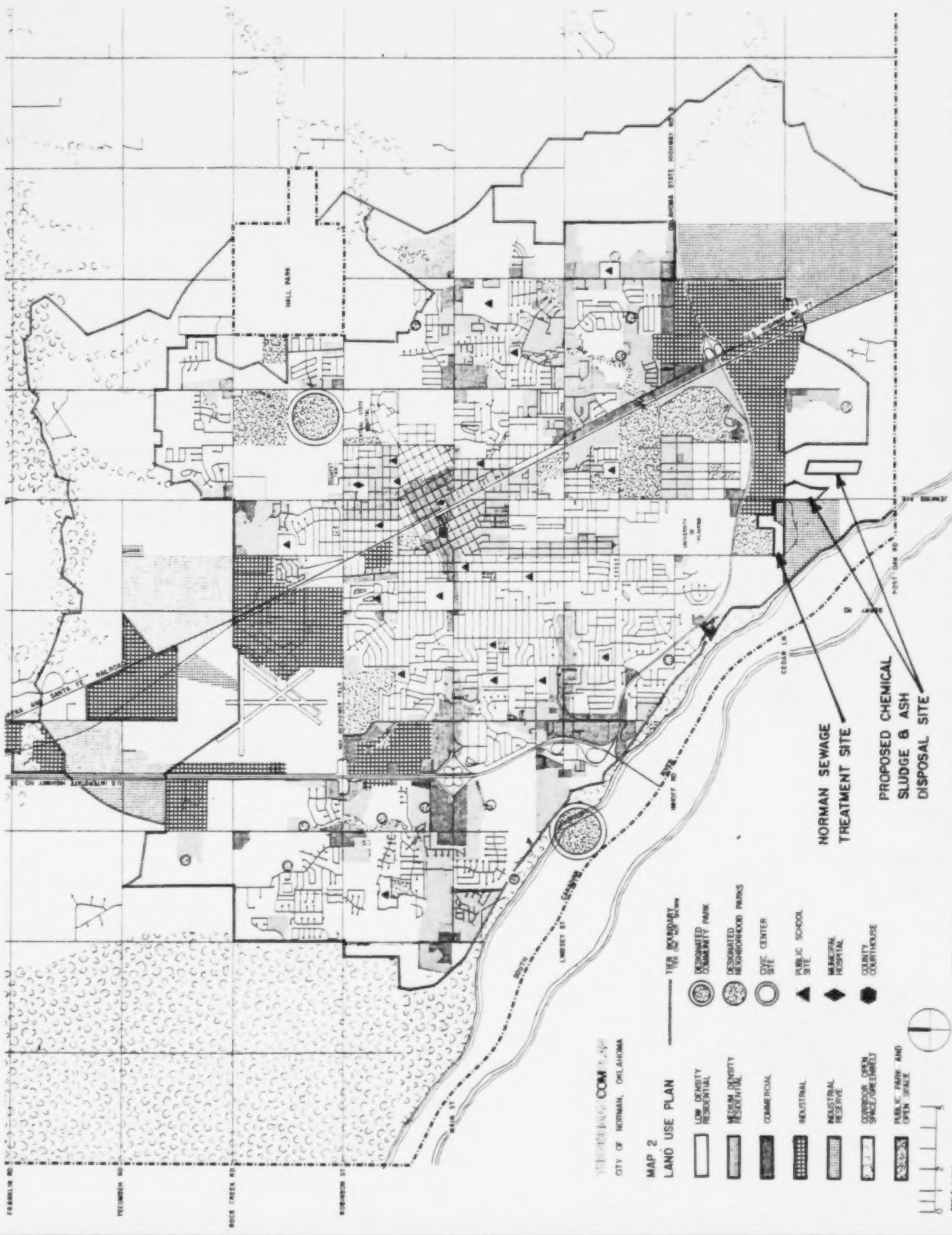
NORMAN SEWAGE TREATMENT SITE
PROPOSED CHEMICAL SLUDGE & ASH DISPOSAL SITE
COMPREHENSIVE PLAN
CITY OF NORMAN, OKLAHOMA
MAP 2
LAND USE PLAN
LOW DENSITY RESIDENTIAL
MEDIUM DENSITY RESIDENTIAL
COMMERCIAL
INDUSTRIAL
INDUSTRIAL RESERVE
CORRIDOR OPEN SPACE/GREENBELT
PUBLIC PARK AND OPEN SPACE
TIER BOUNDARY
DESIGNATED COMMUNITY PARK
DESIGNATED NEIGHBORHOOD PARKS
CIVIC CENTER SITE
PUBLIC SCHOOL SITE
MUNICIPAL HOSPITAL
COUNTY COURTHOUSE
ADOPTED 5 10 81
SCALE
HALL PARK
UNIVERSITY OF OKLAHOMA
FRANKLIN RD
TECUMSEH RD
ROCK CREEK RD
ROBINSON ST
MAIN ST
LINDSEY ST
CEDAR LN
POST OAK RD
SANTA FE RAILROAD
U.S. INTERSTATE HIGHWAY NO. 35
OKLAHOMA STATE HIGHWAY NO. 9

FIGURE 6-10 PROPOSED LAND USE, NORMAN URBAN AREA

PART IV. PREFERRED ALTERNATIVES

A. POSITION OF THE CITY AND CAC

The city of Norman has selected the alternative which was recommended by the facilities plan engineer, endorsed by the Citizens Advisory Committee, and adopted by the Norman City Council. This alternative calls for expansion of the sewer service area to the north and east, in conformance with the city's COMPLAN. Interceptors, collection lines and lift stations would be constructed as needed to relieve current overloaded conditions and to accomodate projected waste flows through the year 2000. The existing treatment would be upgraded to provide secondary treatment utilizing a combination of bio-discs and bio-filters (trickling filters), followed by chlorination. This facility would be capable of treating 10.0 MGD of effluent to a secondary level. Effluent would be discharged to the Canadian River as at present. Sludge treatment would be by anaerobic digestion. For approximately three-quarters of the year, liquid sludge would be disposed of by wet injection. For about one-quarter of the year, the sludge would be dewatered to a dry cake, stockpiled at the plant, and then disked into the soil when land is available for disposal of dry sludge. Both wet and dry land application would occur on private lands by contract between the land owner and the city. Additional treatment units may be necessary depending on final water-quality standards and wasteload allocations.

Further information on the alternative is provided in Appendix B of the Draft EIS, in the draft facilities plan (PSC, 1981) and in PSC, 1982a. The total present worth cost of the proposed facilities is as follows:

interceptors and related improvements	$ 9,802,404
treatment works and sludge management	$16,788,628
TOTAL COST	$26,591,032

Note that the above cost is exclusive of the expense of constructing collection systems in areas of new development, and of providing any advanced treatment units which may be necessary in the future to ensure compliance with water-quality standards.

The preferred alternative is viewed by the Applicant as being: 1) the most adaptable in the face of changing regulations for effluent and sludge disposal; 2) the most flexible in terms of construction and operation especially for near-term solution of NPDES compliance problems; and 3) the least expensive in total dollars.

B. PREFERRED EPA AND OSDH ACTIONS

Based on a thorough review of the city of Norman's facilities plan, the analysis in the Draft and Final EIS's, and written and oral comments received, EPA and the OSDH prefer the alternative of funding construction of eligible portions of the treatment system improvements proposed by the city. That is, subject to considerations such as availability of funds and priority designation, the OSDH would approve funding requests for eligible portions of the facilities described in Section A above, with conditions. Although planning included advanced treatment alternatives, the preferred decision of EPA and OSDH is to approve and support construction of secondary treatment units while deferring advanced treatment decisions until water-quality standards and wasteload allocations have been finalized. Final approval of the facilities plan cannot be made until the environmental review process is complete.

It appears at this point that most of the proposed wastewater treatment plant improvements and sludge disposal system modifications are eligible for federal funding. The Bishop Creek Interceptor improvements, C-1 and C-2, (approved for advanced construction) also appear to be eligible at this time; however, additional flow information may be required before final eligibility can be determined. All remaining linework (including lift stations) are considered not eligible at this time because of insufficient justification for existing need under current law.

In order to lessen the potential for certain environmental impacts, EPA will recommend to the OSDH that certain conditions be placed on any construction grant awarded to the city of Norman. The proposed conditions are summarized below:

1) The city of Norman would be required to seek technical assistance from the local soil and water conservation district, the Oklahoma Conservation Commission, the Association of Central Oklahoma Governments, the Central Oklahoma Master Conservancy District and other local or state agencies, as appropriate, in order to develop an urban runoff water quality control plan. This plan would describe, in detail, the practices that would be taken to minimize erosion during construction in developing areas as well as to minimize runoff from developed urban areas.

2) The city of Norman would be required to have a complete plan for wastewater treatment (liquid disposal, sludge disposal, etc.) which would be implemented regardless of the overall portion funded by EPA.

3) The city of Norman would be required to insure that any grant eligible work performed in the floodplain not cause any increase in flood levels within the community during the base flood discharge.

4) The city of Norman would be required to insure that any cultural resource surveys recommended by the Oklahoma State Historic Preservation Officer or State Archaeologist be completed before construction begins. If significant resources are discovered the city must notify EPA and EPA must comply with the requirements of the Advisory Council or Historic Preservation (36 CFR Part 800) before any action could be taken that would affect the resource. Any grant would

also be conditioned to require that, if previously undetected sites are discovered during construction, work must cease immediately, EPA must be contacted, and the appropriate procedures must be undertaken to insure compliance with cultural resource regulations.

5) The city of Norman would be required to have final plans and specifications for the sludge disposal system approved by the OSDH in accordance with regulations developed to implement the Resource Conservation and Recovery Act (40 CFR Part 257).

APPENDIX A. COMMENT LETTERS AND RESPONSES

Appendix A of this Final EIS reproduces all letters received. Comments which require response are keyed to the control number of the letter in which they appear (for example, comment 6-3 is the third comment in letter no. 6). The numbered responses to specific comments adjoin the appropriate comment letter.

Part III of this Final EIS contains all pages of the Draft EIS which have been corrected or modified in response to the comments. Where changes are of a minor, editorial nature, the complete pages which would be changed are not included in Part III. Instead, the editorial changes are noted in a list of errata beginning on page III-1.

1

United States
Department of
Agriculture

Soil
Conservation
Service

State Office
Stillwater, OK
74074

August 23, 1982

RECEIVED
AUG 26 1982
6 ES

Clinton B. Spotts
Regional EIS Coordinator
U.S. Environmental Protection Agency
Region 6
1201 Elm Street
Dallas, Texas 75270

Dear Mr. Spotts:

We have reviewed the draft environmental impact statement on the awarding of a construction grant under Section 201 of the Clean Water Act for upgrading and expansion of wastewater treatment facilities in Norman, Cleveland County, Oklahoma.

1-1 A minor discrepancy appears to exist concerning the area of agricultural land expected to be affected by the project. Section 6.2.6, page 6-31, indicates that the proposed action would lead to the urbanization of about 1120 acres in the Little River basin. Section 6.6.2, page 6-68, states that 1200 acres are projected to develop in the Little River basin as a result of the proposed project.

The impacts on environmentally sensitive agricultural land are clearly described and should provide decisionmakers a sound basis for selection of the preferred alternative in this proposed action.

We appreciate the opportunity to review and comment on this draft EIS.

Sincerely,

Roland R. Willis
State Conservationist

cc:
Chief, SCS, Washington, D.C.

The Soil Conservation Service
is an agency of the
Department of Agriculture

SCS-AS-1
10-79

1-1 At the bottom of p. 6-30 of the Draft EIS, there was a typographical error. It should read "1080 acres of residential land". Including the 90 acres of industrial land, the total area urbanized would be 1170 acres. The value of 1200 on p. 6-68 reflects rounding of the numbers.

2

DEPARTMENT OF THE ARMY
SOUTHWESTERN DIVISION, CORPS OF ENGINEERS
1114 COMMERCE STREET
DALLAS, TEXAS 75242

REPLY TO
ATTENTION OF

RECEIVED
SEP 10 1982
6 ES

SWDPL-R

SUBJECT: Wastewater Treatment Facilities: City of Norman, Cleveland County, Oklahoma DEIS

Dick Whittington, Regional Administrator
U.S. Enviornmental Protection Agency
Region 6
1201 Elm Street
Dallas, Texas 75270

Dear Mr. Whittington:

The Draft Environmental Impact Statement on the City of Norman, Oklahoma wastewater treatment facilities has been reviewed by my staff. Comments on the DEIS are inclosed.

Thank you for the opportunity to review this DEIS.

FOR THE COMMANDER:

for Ivan L. Hobson
BARRY G. ROUGHT, P.E.
Chief, Planning Division

1 Incl
As stated

SUBJECT: Wastewater Treatment Facilities: City of Norman, Cleveland County, Oklahoma DEIS

COMMENT

Paragraph 6.5.3 Impacts of Collection Alternatives

2-1 The DEIS, as written, reflects inadequate procedures and timing of the archeological survey which needs to be performed prior to construction of the project. The second line of this paragraph should state that "where lines are projected to cross previously undisturbed areas, an archeological reconnaissance will be conducted as soon as the alignments are known."

2-1 The Draft EIS has been revised. See Part III, Section A of the Final EIS, Errata for page 6-55 (pp. III-2 and III-3). See also Part IV, Section B.

3

Federal Emergency Management Agency
Region VI Federal Center Denton, Texas 76201

September 24, 1982

RECEIVED
SEP 28 1982
6 ES

Mr. Clinton B. Spotts
Regional EIS Coordinator
U. S. Environmental Protection
Agency, Region 6
1201 Elm Street
Dallas, Texas 75270

Dear Mr. Spotts:

The following comments are offered on the Draft Environmental Impact Statement (DEIS) on the awarding of a construction grant for upgrading the wastewater facilities in Norman, Oklahoma.

It was mentioned in the DEIS that several existing sections of interceptors are located in the 100-year flood plain. Some of the proposed interceptors also appear to be located within the floodway, as shown in Figures 6-3 and 6-5 of the DEIS. To comply with National Flood Insurance Program Regulations and the City of Norman's flood plain management ordinance, any encroachment in the floodway must be prohibited if it will cause any increase in flood levels within the community during the base flood discharge. Plans for any channelization must be submitted to the Federal Emergency Management Agency at least six months prior to the expected completion date of the project. 3-1

Any construction in the flood plain also must comply with the requirements of Executive Order 11988, "Floodplain Management." The objective of Executive Order 11988 is to avoid adverse impacts to flood plains and to avoid direct or indirect support of flood plain development. 3-2

If we may provide additional information, please let us know.

Sincerely,

R. Dell Greer
Chief
Natural and Technological
Hazards Division

3-1 Measures to avoid an increase in base flood levels are described on page 6-35 of the Draft EIS and in Table I-3 of this Final EIS. For any construction grant awarded to Norman, EPA proposes to include as a grant condition an assurance that base flood discharges will not be increased (see Section B, Part IV of this Final EIS).

3-2 See the Flood plain construction notice in Appendix C of the Draft EIS.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta, Georgia 30333
(404) 262-6649
September 3, 1982

RECEIVED
SEP 7 1982
6 ES

Mr. Clinton B. Spotts
Regional EIS Coordinator
U.S. Environmental Protection Agency
1201 Elm Street
Dallas, Texas 75270

Dear Mr. Spotts:

We have reviewed the Draft Environmental Impact Statement (EIS) for the possible awarding of construction funds for wastewater treatment facilities for the City of Norman, Cleveland County, Oklahoma. We are responding on behalf of the U.S. Public Health Service and are offering the following comments for your consideration in preparing the final document.

We are in support of those improvements necessary to improve wastewater treatment practices and minimize potential adverse public health effects and water quality effects caused by inadequate sewage treatment, sewage overflows, and improper sludge disposal practices. However, satisfactory safeguards must be incorporated into the project to minimize potential adverse public health risks. Special attention and care must be taken to protect public and private drinking water supplies and air quality from adverse impacts associated with the treatment, stockpiling, and transport of sewage and sludge.

4-1 We are primarily concerned about the potential secondary development effects of the proposed improvements upon Lake Thunderbird, the downstream municipal water supply source for Norman, Midwest City, and Del City. The EIS indicates that "until more information is available, it will be difficult to develop any program specifically designed to protect the lake." While EPA can condition its grant for construction of sewage transportation and treatment facilities to reduce adverse sedimentation to Lake Thunderbird, the type conditions and programs to effectively maintain and protect water quality will require detailed research and appropriate water quality studies (page 5-47) of the lake and the watershed. To what extent have the Association of Central Oklahoma Governments (ACOG) and your agency conducted these studies?

4-2 The location of the proposed sludge disposal practices in close proximity to residential land uses may not be in the best public interest should this land be developed in the future. Future development of such lands should be in accord with area planning and land use compatibility goals. The use of these lands in the future for residences or for structures that conflict with local residential land use may be inappropriate since the soils could contain harmful levels of toxic and hazardous materials which could enter into the food chain.

4-3 The potential vector impacts associated with each alternative should be discussed. EPA should determine from local health authorities if a history of vector-borne disease and nuisance problems exists in the area.

We appreciate the opportunity to review this Draft EIS. Please send us one copy of the final document when it is available. If you have questions about any of our comments, please contact Mr. Robert Kay of my staff at FTS 236-6649.

Sincerely yours,

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Center for Environmental Health

4-1 See response to Issue 1b, presented in Part II, Section C of the Final EIS (p. II-10).

4-2 The city of Norman no longer proposes to dispose of sludge at the site identified in the Draft EIS. See response to Issue 6a, presented in Part II, Section C of the Final EIS (p. II-17).

4-3 The Oklahoma State Department of Health Supervising Sanitarian for Cleveland County, J.T. Brown, was contacted regarding vector problems in the Norman area. The few and intermittent problems which have occurred include rats at the grain elevator, and rats and skunks at the city landfill. During construction of new development, field mice have been driven from the fields that are cleared into neighboring houses; this nuisance has been controlled by private individuals setting mousetraps. A few cases of Rocky Mountain tick fever have occurred in Norman; this disease is carried by ticks which in turn are carried by dogs and other mammals. Mr. Brown states that, apart from the tick fever, not one case of disease has occurred which can be directly associated with identifiable vectors. None of these problems are associated with wastewater treatment.

See pages 6-59 and 6-74 of the Draft EIS for a discussion of health impacts associated with the collection system. Section 5.4 discusses disease-causing organisms associated with sludge management. All alternatives for wastewater treatment would improve operations at the treatment plant, thus reducing potential populations of flies and other nuisance organisms. Improvement of the sewage effluent would reduce the likelihood of disease being transmitted to persons who come in contact with Canadian River water. Temporary infestations of field mice may occur in houses near new construction; to the extent that sewer service facilitates development, this would be an indirect impact of the proposed action.

5

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FORT WORTH SERVICE OFFICE
221 WEST LANCASTER AVENUE
P.O. BOX 2905
FORT WORTH, TEXAS 76113

REGION VI

IN REPLY REFER TO:

September 16, 1982

Mr. Clinton B. Spotts
Regional EIS Coordinator
U.S. Environmental Protection Agency
Region 6
1201 Elm Street
Dallas, TX 75270

Dear Mr. Spotts:

This is to inform you that the Draft Environmental Impact Statement for Wastewater Treatment Facilities for the City of Norman, Oklahoma, has been reviewed in the U.S. Department of Housing and Urban Development's Oklahoma City Area Office and Fort Worth Regional Office and that it has been determined that the Department will not have comments on the subject Statement.

Sincerely,

for
Victor J. Hancock
Environmental Clearance Officer

6

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER 82/1273

SEP 10 1982

Dick Whittington, P.E.
Regional Administrator, Region VI
Environmental Protection Agency
1201 Elm Street
Dallas, Texas 75270

Dear Mr. Whittington:

The Department of the Interior has reviewed the draft environmental statement for wastewater facilities, City of Norman, Cleveland County, Oklahoma. We have the following comments and recommendations.

General

We understand that the issues raised in the environmental statement are complex in nature, and it is difficult to predict future water quality problems in a drainage affected by potential urban and industrial surface runoff. Our Bureau of Reclamation (BR) constructed Lake Thunderbird during the period 1962 through 1965 as a municipal water supply reservoir for the City of Norman and the Oklahoma City suburbs of Del City and Midwest City. The reservoir is also a major recreational facility for the Oklahoma City area. Our primary concern is protecting the watershed and the water supply for project use. This appears to be in concert with the number one priority issue identified during the public participation process (pages 6-73 and 7-2).

6-1 The proposal to construct sewer extensions into undeveloped portions of the Little River Watershed (Lake Thunderbird), which will likely result in increased nonpoint source pollution, is the most controversial issue concerning this project. Although the statement briefly discusses the importance of Lake Thunderbird as the principal water supply for the Norman area, it inadequately addresses the existing recreational and aesthetic value of the lake for fishing, hunting, swimming and boating or the project related impacts on these uses. These issues should be discussed in the final statement.

6-2 Under Oklahoma Water Quality Standards the waters of Lake Thunderbird and its watershed are protected by prohibition of any new point source discharge of wastes or increased loading from an existing point source. This beneficial use limitation is the highest level of protection provided by the water quality standards. In addition, the Anti-Degradation Policy of the Standards states that "Existing instream water uses shall be maintained and protected. No further water quality degradation which would interfere with or become injurious to existing instream water uses shall be allowed." Since the statement notes that the expansion of Norman's sewer service area into the lake's watershed could adversely affect water quality and jeopardize existing water uses, it appears that the project may result in noncompliance with Oklahoma's Water Quality Standards. This should be clarified in the final statement.

6-1 See response to Issue 1f, presented in Part II, Section C of the Final EIS (p. II-12).

6-2 See response to Issue 1g, presented in Part II, Section C of the Final EIS (p. II-13).

6

Mr. Dick Whittington 2

6-3 In regard to the proposed project, we have concerns over the impacts associated with the
ultimate urbanization of 4,700 acres or more within the Lake Thunderbird watershed (600
acres to be served initially) when there may be alternatives such as encouraging urban
development in the watershed to the west or south side of Norman (pages 5-3 and 5-6).
6-4 In any development plan, flood zones as identified on page 6-11 would have to be
avoided. It appears from the text that a 22 percent increase in phosphorus loading could
ultimately occur. This, when compounded by growth in the City of Moore, indicates a
potential doubling of phosphorus loading within the basin according to predictions (page
6-5 5-7). We understand it is difficult to determine at what point phosphorus loading would
cause the lake to become eutrophic; accordingly, every effort should be made to prevent
this from occurring.

6-6 Should the proposed project ultimately be selected, we recommend that attention be given to ensuring that developers provide adequate and effective drainage systems to reduce surface runoff and erosion problems during and after construction. Consideration should also be given to provide stormwater retention basins in critical areas to reduce pollutant loads.

6-7 The statement indicates that runoff from urbanized lands carries more pollutants than runoff from open, undeveloped areas. This is of particular concern with pollutant loading potential from the City of Moore (page 6-33), which is estimated to increase 25 percent above current levels in future years. The statement quotes from Association of Central Oklahoma Governments urban runoff modeling a 26 to 400 percent increase for various pollutants for the Little River Basin by the year 2000 (page 6-22). From this information, it appears that a basinwide plan or approach to watershed protection is required for protecting the water quality of Lake Thunderbird.

Several of the alternatives, including the proposed project, would result in the develop-
ment of several miles of new sewer lines. With a minimal expenditure of funds, a series
of trails along these sewer lines could link Little River State Park, Hall Park and other
public areas with surrounding communities. We encourage the project sponsor to investi-
6-8 gate with other concerned local agencies the possibility of developing jogging, hiking and
biking trails.

We are pleased with the coordination efforts with the State Historic Preservation
Office. We recommend that the final statement include the results of contacts with
6-9 Mr. Abe Hesser, Executive Director, Oklahoma Tourism and Recreation Department, 500
Will Rogers Memorial Building, Oklahoma City, Oklahoma 73105. Mr. Hesser also has the
responsibility for the State's Natural Heritage Program.

There is no Indian-owned trust property within the Anadarko Area jurisdiction that will be directly involved in the proposed project. The nearest Indian-owned trust land is located on the East side of Lake Thunderbird. There is approximately fourteen hundred (1,400) acres of allotted (Absentee Shawnee Tribe) trust lands. These lands are within the area around Lake Thunderbird that was annexed in 1961 by the City of Norman, but are outside the service area of the proposed project. These lands are mostly leased to non-Indians and used in conjunction with farming and livestock operations. No plans for commercial or residential development are pending.

6-3 See response to Issue 1a, presented in Part II, Section C of the Final EIS (pp. II-9 and II-10).

6-4 The reasons for placing sewer lines along flood plains and mitigation measures are discussed on the Draft EIS on pages 6-34 to 6-35 and C-6.

6-5 See response to Issue 1, presented in Part II, Section C of the Final EIS (pp. II-9 to II-14).

6-6 See response to Issue 1d, presented in Part II, Section C of the Final EIS (p. II-11).

6-7 EPA agrees with this comment. See response to Issue 1c, presented in Part II, Section C of the Final EIS (p. II-10).

6-8 See response to Issue 6d, Part II, Section C of the Final EIS (p. II-18).

6-9 This contact was made. A letter was received from the Natural Heritage Program and is included in this Appendix (Letter 10).

6

Specific

Page 6-19, Section 6.2.3 Existing Conditions: Water Quality - Lake Thunderbird

6-10 The second paragraph on page 6-19 states that mercury was found to be excessive when compared to the recommended standards for public water supply. In addition, mercury levels exceeded the standards for the protection of aquatic life. Due to the toxicity and bioaccumulation rate of mercury on both humans and aquatic organisms, the presence of this toxic metal in the Lake Thunderbird watershed should be discussed in more detail. The levels of mercury found in water, sediment, and fish tissue should be presented in the statement along with the potential sources of mercury.

6-10 See response to Issue 1e, presented in Part II, Section C of the Final EIS (pp. II-11 to II-12).

Page 6-33, Section 6.2.6 Impacts of Collection Alternatives - Impacts of growth on Lake Thunderbird

6-11 In this section it is stated that lead levels in Lake Thunderbird are expected to increase. However, the environmental statement concludes that most of the lead in runoff would be associated with sediment, so that actual levels in the water would not be excessive. Lead in sediment may be more detrimental to certain aquatic organisms, particularly bottom feeding fish (catfish, carp) and benthic invertebrates, than lead in the water column. Since bottom dwelling organisms accumulate most contaminants from sediments, increased lead in the sediment deposits of Lake Thunderbird could result in an adverse impact.

6-11 The Draft EIS has been corrected. See Part III, Section A of the Final EIS, Errata for page 6-33 (p. III-2).

Page 6-47, Section 6.4 BIOLOGY: ENDANGERED SPECIES

6-12 This section should reference a recent publication (1980) entitled The Canadian River and Floodplain in Norman, Oklahoma: Environmental Perspective, prepared by Joseph Grzybouski for the Norman Environmental Control Advisory Board. This report contains useful information on the physiography, vegetation, aquatic habitats, and land use of the Canadian River and its floodplain.

6-12 See Part III, Section A of the Final EIS, Errata for pages 6-48 and 9-3 (pp. III-2 and III-3).

Page 6-48, Aquatic communities

6-13 The second paragraph states that "very high water temperatures - as much as 100 degrees F" occur on the Canadian River. The statement should mention the mean water temperature and the frequency and duration of water temperatures greater than 90 degrees F in the river.

6-13 See Tables A-2 and A-3, Appendix A of the Draft EIS. Existing data are insufficient to provide valid frequency/duration information. ACOG conducted a sampling program in 1980. On three consecutive days in July, 36 temperature measurements were taken at six locations along the Canadian River. 39 percent of the readings were above 90°F; the average was 88°F (ACOG 1981b).

Page 6-50, Aquatic communities

6-14 The first sentence of this paragraph states "At present, the Canadian is designated by the Oklahoma Water Resources Board as a "warm-water fishery". The 1979 Oklahoma Water Quality Standards does not contain a "warm-water fishery" beneficial use. This phrase should be changed throughout the statement to "fish and wildlife propagation" to reflect the current language in the standards.

6-14 See Part III, Section A of the Final EIS, Errata for page 6-50 (p. III-2). "Warm-water fishery" is essentially the definition of "Fish and Wildlife Propagation" and the two terms are used interchangeably. See also response to Issue 5, presented in Part II, Section C of the Final EIS (pp. II-16 to II-17).

6

6-15 The environmental statement mentions that periods of very low flow, wildly fluctuating flows, and very high water temperatures limit the fishery of the Canadian River. Because of these limiting factors, the statement notes that improving water quality to meet the standards may not improve the fishery; therefore, lower standards have been proposed. Fishes in the Canadian River are adapted to drastic seasonal changes in the river. Fish compensate by finding refuge in deeper pools and shaded areas. Although these natural occurrences affect both the composition and abundance of the fishery, the river continues to sustain a viable aquatic ecosystem consisting of fish from several trophic levels. The existing fishery and the natural phenomena that influence it should not affect the need to improve the river's water quality and meet the goals of the Clean Water Act.

Summary

6-16 We remain concerned that increased pollutants in the Little River Watershed resulting from the extension of Norman's sewer system could adversely affect the biology and project uses of Lake Thunderbird. Due to the value of this lake in providing regional recreational and economic benefits, we urge that stringent controls be implemented to abate nonpoint source pollution into the lake.

Sincerely,

Bruce Blanchard, Director
Environmental Project Review

6-15 See response to Issue 5, presented in Part II, Section C of the Final EIS (p. II-16).

6-16 See response to Issue 1, presented in Part II, Section C of the Final EIS (pp. II-9 to II-14).

7

U.S. Department of Transportation
Federal Aviation Administration

Southwest Region
Arkansas, Louisiana
New Mexico, Oklahoma
Texas

P.O. Box 1689
4400 Blue Mound Road
Fort Worth, Texas 76101

RECEIVED
1982

AUG 25 1982

Mr. Clinton B. Spotts
Regional EIS Coordinator
Environmental Protection Agency
Region 6
1201 Elm Street
Dallas, Texas 75270

Dear Mr. Spotts:

We have completed our review of the Draft Environmental Impact Statement for Wastewater Treatment Facilities, City of Norman, Cleveland County, Oklahoma, and have no comments.

We appreciate the opportunity for review.

Sincerely,

Gene L. Faulkner

Gene L. Faulkner
Manager, Planning and Programming Branch

8

The
University of Oklahoma

OKLAHOMA ARCHAEOLOGICAL SURVEY
1808 Newton Drive
Norman, Oklahoma 73019
(405) 325-7211

RECEIVED
AUG 26 1982

August 25, 1982

Clinton B. Spotts
Regional EIS Coordinator
United States Environmental
Protection Agency
Region IV
1201 Elm Street
Dallas, Texas 75270

Re: Draft Environmental Impact Statement, Waste Water Treatment Facilities, City of Norman, Cleveland County, Oklahoma.

Dear Mr. Spotts:

Enclosed are a few general comments relating to the sections on archaeological and historical effects by the project (Section 6.5). Some of the comments deal with the inclusion of such conditional action verbs as should rather than will, while other statements limit the recommendations that can be made by the surveying archaeologist. Table 5-3 (Source: EPA, 1977b) - Possible Construction Impact Mitigation Measures - lists none of the acceptable forms of mitigation of adverse effects to archaeological/historical resources (Re: Table 5.3 and Section 6.5.7, last sentence). And finally, no consideration is given to the indirect effects of improved waste water treatment facilities on the preservation vs. rate of desctruction of archaeological/historical resources, nor are any mitigative measures for these indirect effects considered. One example of "indirect impacts" is listed in enclosure I.

8-1 As you may or may-not be aware, our agency will conduct upon request and at no charge the necessary initial survey for this project and make recommendations, as we have for other cities and towns in the state. We had asked for notification when alternatives were more finalized than the 700+ acre, two county study area we were recently presented with (see my letter of April 16, 1982 pg C-3). At that time we would have conducted the surveys needed to allow a better evaluation of the alternatives presented in the draft EIS. We have also signed off previously on the portions of this project presented under "emergency" grants, as most of this area was in presently developed portions of the city (Bishop Creek lines). However, we have not received notification of final alternatives nor notification to proceed with the survey of these alternatives for cultural historical remains in the area of the waste water treatment plant expansion.

Thank you for the opportunity to comment on the draft EIS for the City of Norman Waste Water Treatment Plant Expansion.

Sincerely,

Larry Neal
Larry Neal
Staff Archaeologist

LN:ng

cc: Marshall Gettys - S.H.P.O.
Larry Banks - A.C.E., Dallas

8-1 At the time of publication of the Draft EIS, the city had not yet selected its preferred alternative. As the preferred alternative now stands, there will be no expansion of the treatment plant onto new land, and disposal of sludge will occur on private land. It is also unlikely that any linework, with the possible exception of the Bishop Creek Interceptor (lines C-1 and C-2) will be eligible for EPA funding. Notification of sewer line construction will occur as outlined in section 6.5.3 of the Draft EIS and in Part IV, Section 8 of the Final EIS.

8

Enclosure I

General Comments:

6.5 Archaeological and Historical Resources

6.5.1. Existing Conditions

8-2 Human entry into central Oklahoma probably occurred at least *11,000 years ago, and possibly as early as 10,000 years ago,* as Paleo-Indian hunter-gatherers.---

8-2 See Part III, Section A of the Final EIS, Errata for page 6-55 (p. III-2). [Note: In a telephone conversation, Mr. Neal stated that his letter should have read "as early as 20,000 years ago".]

6.5.3. Impacts of Collection Alternatives

8-3 Should read - - -"Prior to construction of routes in undeveloped areas, rights-of-way *will be* staked out and inspected by an archaeologist. If sites are found, that warrant testing provisions *will be made* for either mechanical or manual testing, as required by the archaeologist, so that eligability for the National Register of Historic Places may be determined, and any further necessary mitigation measures may be defined. - - -

8-3 EPA will condition any construction grant to ensure that appropriate actions are taken to protect cultural resources; see Part IV, Section B of this Final EIS.

Indirect Impacts are not addressed in the assessment:

8-4 For Example: Additional sewerage facilities will encourage urbanization. This will make more likely that new housing construction could cause damage or destruction of archaeological and historical resources which might otherwise survive.

Mitigation: Identify and set aside and/or study archaeological and historical resources that may be capable of adding to our knowledge of the past, or enhancing the economic, educational, or social values of the city, county and state.

8-4 See Part III, Section A of the Final EIS, Errata for page 6-55 (pp. III-2 and III-3). See also Table I-3 of this Final EIS.

9

OKLAHOMA DEPARTMENT OF ECONOMIC AND COMMUNITY AFFAIRS
FEDERAL ASSISTANCE MANAGEMENT DIVISION
State Grant-In-Aid Clearinghouse
4545 N. LINCOLN, SUITE 285 OKLAHOMA CITY, OKLAHOMA 73105 (405) 528-8200

August 19, 1982

RECEIVED
AUG 23 1982
6 ES

Mr. Clinton B. Spotts
Regional EIS Coordinator
U. S. Environmental Protection Agency, Region 6
1201 Elm Street
Dallas, Texas 75270

RE: 29G216 - Draft Environmental Impact Statement for
Wastewater Treatment Facilities in Norman,
Oklahoma, (SAI #820819-010)

Dear Mr. Spotts:

The environmental information for the above referenced project has been reviewed in accordance with OMB Circular A-95 and Section 102 (2) (C) of the National Environmental Policy Act by the state agencies charged with enforcing environmental standards in the State of Oklahoma.

The state agencies, comprising the Pollution Control Coordinating Board, have reviewed the proposed project and agree that no adverse environmental impact is anticipated. Therefore, the state clearinghouse requires no further review.

Sincerely,

Lucille McShane
for Don N. Strain
Director

DNS:mt

10

STATE OF OKLAHOMA
TOURISM AND RECREATION DEPARTMENT

OKLAHOMA NATURAL HERITAGE PROGRAM

November 22, 1982

Mr. Clinton Spotts, Regional EIS Coordinator
U.S. Environmental Protection Agency, Region 6
1201 Elm Street
Dallas, TX 75270

Ref.: Draft EIS, City of Norman
Oklahoma Wastewater Treatment
Facilities

Dear Mr. Spotts:

In reference to the request for comments concerning the Draft EIS for the Norman wastewater treatment facility, I have inspected our files for occurrences of any previously identified rare species or important biotic communities within the project area. No such occurrences are known for this area. Based upon the information at hand,the Natural Heritage Program has no objections to the proposed project as it is now written.

Because the quantity and quality of data collected by the Natural Heritage Program are dependent on the research and observations of many individuals and organizations, the findings presented here should not be considered as a substitute for on-site surveys.

Thank you for the opportunity to comment on this project.

Sincerely,

Ian H. Butler

Ian H. Butler
Program Coordinator

500 WILL ROGERS BUILDING • OKLAHOMA CITY, OKLAHOMA 73105

11

Association of
Central
Oklahoma
Governments

4801 Classen Boulevard, Suite 200
Oklahoma City, Oklahoma 73118
(405) 848-8961

RECEIVED
SEP 2 1982
6 ES

August 31, 1982

Clinton B. Spotts, Regional EIS Coordinator
EPA
Region 6, 1201 Elm Street
Dallas, Texas 75270

Re: PN#780766.418-10-NOI/EIS; Draft EIS, Norman Wastewater Treatment Facility

Dear Mr. Spotts:

In conformance with the Office of Management and Budget Circular A-95 Revised, the Association of Central Oklahoma Governments staff comments indicate that the draft EIS has appropriately responded to the environmental impacts that could reasonably be expected from construction of this facility.

The project is consistent with areawide plans, and funding for construction is urged.

The Environmental Impact Statement has now satisfied the requirements contained in OMB A-95, as far as this regional clearinghouse is concerned.

Sincerely,

Zach D. Taylor
Executive Director

ZDT/cw

cc: Roy Carmack, Chairman, ACOG Board of Directors
Don Strain, Director, State Clearinghouse
William S. Morgan, Mayor of Norman

Chairman Roy Carmack
Councilman The Village

Vice Chairman William S. Morgan
Mayor, Norman

Secretary Treasurer Eldon Lyon
Mayor, Bethany

Executive Director
Zach D. Taylor

12

SEP 10 1982
6 ES

September 6, 1982

Mr. Clinton B. Spotts, Regional EIS Coordinator
U.S. Environmental Protection Agency, Region 6
1201 Elm Street
Dallas, Texas 75270

Dear Mr. Spotts:

I am enclosing a copy of a talk I presented to the panel at the public hearing on the Draft Environenmental Impact Statement, Water Treatment Facilities in Norman, Oklahoma on September 2, 1982.

I am City Council Representative for Ward 5 in Norman and this area is almost entirely within the Lake Thunderbird drainage area. I have driven the area many times and talked with hundreds of the 8,500 people who reside in the area so I have a first hand knowledge of the problems on drainage, onsite septic systems, litter, and depreciation of property values.

The homes and land to the East in the moratorium area have depreciated in value, and shopping centers (Heisman and Colonial Estates) have suffered financially.

We urge EPA to give approval to the expansion of sewer service into the Thunderbird drainage basin because this area is developing now but without a plan or controls. Sewer service will prevent the deterioration of the land and the uncontrolled, sprawled growth on hundreds of acres of land.

I am enclosing a chart which reflects the number of permits issued in 1980 and 1981 for the 5 acre and over type of development.

The water supply is on the East side of Norman so the cost of providing water will be much less because of the cost of pumping water so far from the source.

A sewer loop will be much cheaper to build and more effecient to maintain than the long neck extending to the North of Woodcrest. I support opening lift station E before extending so far North. This will encourage a more compact development and we have a water supply in the basin. We do not have water distribution lines so far North of Woodcrest. By opening E now we would have some time to get water distribution lines to the North and open that area later.

Sooner Road is under construction and with this 4 lane arterial connecting Highway 9 and Oklahoma City, this area will develop sooner than Norman Planners had planned. We know this so now is the time to build sewer lines and lift stations large enough to accomodate that growth.

If you have questions about this correspondence, please feel free to contact me either through the City or my home. The phone number is 405-364-2671.

Sincerely,

Lillie Mae Goddard

Lillie Mae Goddard, Council Representative, Ward 5

12 The enclosures cited in the letter are part of the official record but have not been reprinted in this Final EIS. The comments in the letter itself generally are supportive of the preferred action and require no specific response. An exception is the comment regarding Woodcrest; see response to Issue 2, presented in Part II, Section C of the Final EIS (pp. II-14 to II-15).

13

HEIPLE LAW OFFICES, INC.
105 COMANCHE BUILDING
P. O. BOX 847
NORMAN, OKLAHOMA 73070
(405) 321-0090

August 25, 1982

RECEIVED
AUG 27 1982
6 ES

Mr. Clinton B. Spotts
Regional EIS Coordinator
U.S. Environmental Protection Agency
1201 Elm Street
Dallas, TX 75270

Re: EIS, Wastewater Treatment
Facilities, Norman, OK

Dear Mr. Spotts:

Pursuant to your letter of July 14, 1982, with accompanying letter from Regional Administrator Dick Whittington, this response is submitted to the draft EIS for the subject project, on behalf of the Norman Developers Council.

13-1 We agree with the principal impacts of the project, with one exception: the proposed alternative will not create the lifting of the hookup moratorium in the Bishop Creek area. That moratorium is being lifted because of funds generated as a result of a Federal Court judgment against the City of Norman. EPA funds may be expediting the completion of new lines in the Bishop Creek area.

Based on information to us, we agree with the summary that the preferred alternative appears to be new interceptors, lift stations and collection lines, with a bio-disc facility for secondary treatment, and sludge facilities for anaerobic digestion followed by wet application. Whatever alternative is ultimately chosen, we respectfully urge EPA to fund such alternative. The record of the City of Norman, and its citizens, reflects a consistent effort to see that both the letter and spirit of environmental protection guidelines are met. We appreciate the opportunity for input. We would like to receive a final copy of the EIS.

Sincerely,

H. L. Heiple

HLH:cfh

13-1 For purposes of consideration for Federal funding, it was necessary to include alternatives for the Bishop Creek Interceptor in the main facilities plan and EIS. The reasons for this approach are discussed in Section 4.2 of the Draft EIS.

14

CANADIAN RIVER PARK ASSOCIATION, INC.

823 North Berry
Norman, OK 73069

RECEIVED
SEP 13 1982
6 ES

8 September 1982

Presley Hatcher
U.S. Environmental Protection Agency

Dear Mr. Hatcher,

This letter is a comment voicing the concerns of the Canadian River Park Association (CRPA) on the plans for development found in the Draft EPA Environmental Impact Statement of Wastewater Treatment Facilities for the City of Norman. The CRPA is a recently incorporated group of concerned citizens interested in maintaining the diversity of opportunity and community quality enhanced by the natural assets of the Canadian River and floodplain. While our individual concerns are broader, the comments found herein will focus on potential adverse impacts on the Canadian River.

14-1 In general, the Draft EIS appears to be a fine effort at evaluating the various alternatives for developing Norman's wastewater treatment facilities. However, it appears to suffer from the limitations of the scope of the study, namely, the municipal boundaries of Norman. This is apparent in a Summary statement found on page 1-3 (paragraph 3) commenting on an alternative shift in growth to the Canadian River Basin from the Little River Basin. While the EIS states the projected impacts of its proposed development on Lake Thunderbird and the Little River Basin, its statements lose meaning since the EIS minimizes emphasis on the interaction and addition of impacts by development in Moore and rural Norman. This is recognized in the EIS (eg. p. 6-33, par. 2) which begs consideration and planning of a broader, inter-municipal scope. Since development in the Canadian River basin is viewed undesireable by the EIS, it would seem reasonable that planned sewerage for some acreage, perhaps 600 acres which could accomodate more immediate development needs, be recommended by the current EIS while awaiting the planning of broader, more comprehensive, watershed scope. This would also alleviate or lessen some of the current pressure for development to the west of Norman, and accomodate the concern about "leap-frogging" by developers.

14-2 CRPA is appalled by the requirement that all sewage collected in the Little River basin be pumped into the Canadian River Basin (p. 1-3). Given this scenario, however, we find it disturbing that the current waste treatment practices (already inadequate in meeting water quality standards for discharge) be considered as a viable and

14-1 As the citations indicate, the EIS recognizes that the alternatives evaluated do not address all the germane issues of watershed management. This matter is discussed in Part II, Section C of the Final EIS, response to Issue 1 (pp. II-9 to II-14).

The EIS reaches no conclusion about the desireability of growth in the Canadian vs. the Little River watershed. The comment to limit sewered acreage in the Little River basin appears to be in agreement with the stated intentions of the city of Norman (see page 5-6 of the Draft EIS).

14-2 See response to Issue 5, presented in Part II, Section C of the Final EIS (pp. II-16 to II-17). The proposed action is intended to upgrade treatment practices in Norman to the point that adverse impacts would be controlled and the discharge would unquestionably be a resource. EPA considers that properly reclaimed water is of benefit to stream ecosystems, especially in periods of low flow. Analogies to the impacts of poorly treated discharges serve to identify the kinds of problems which should not occur from proper implementation of the proposed action.

The statement on p. 6-34 is intended to mean that runoff from new development in Norman will cause no degradation of the Canadian River, but the Norman wastewater facilities plan does not address violations of standards which result from natural causes or from other dischargers.

14

14-2 recommended alternative. CRPA fears that the Canadian River Basin is viewed and treated in the EIS as a "dumping" area where inadequacies, undesireables and problems can be overflowed into the Canadian River and downstream to the next community, or ignored. This attitude may influence other areas of community development along the River and serve as a vector to destroy the positive values the River has for the Norman community. Specifically, the notion stated in the EIS that waste water discharge has positive values appears naive and erroneous in light of the current inadequacies in the Norman system, the problematic discharge of Moore's sewage in the Canadian River at Franklin Street, and the demonstrated inadequacies of that type of treatment system in general for many communities. The EIS erroneously considered discharge at low flow as having the highest benefit; yet Moore's discharge has the greatest adverse impact at low flow periods (when it is not diluted) affecting several miles of River by killing fish, eliminating turtles, creating algae blooms and bad odors, and being an aesthetically displeasing health hazard. The statement on p 6-34 that "No water-quality standards would be exceeded in the year 2000 which are not already exceeded" for the Canadian River is hardly consoling in light of the current problems.

14-3 It is also not consoling that effluent standards for Norman have not been determined (pp. 1.1 and 4.10). How can a plan for waste water treatment be established without such standards?

14-4 As our final general concern, we would comment on the notion voiced in the EIS that energy conservation was a major factor leading to facility plan selection. In a state which is talking of major water transfers and projected water shortages, we find it puzzling that water conservation is not also a major consideration. Such consideration now would certainly create great energy and financial savings over potential water transfer costs which may be necessary beyond the year 2000. The EIS should seriously consider various forms of recycling options.

14-5 As comments of more specific scope, CRPA offers the following.

1) Figure 5-5. The proposed chemical sludge and ash disposal sites are very close to Bishop Creek. For reasons of maintaining water quality, natural diversity and preventing health hazards, CRPA recommends such sites be located in upland areas at a distance from stream courses where they are unlikely to seap or otherwise impact watercourses.

14-6 2) The section on biology (6.4) has a number of inaccuracies.
  a) p. 6-50, par. 3 - Except for herons and egrets (which are only loosely considered shorebirds), most shorebirds (such as sandpipers and plovers) do not eat fish but rather consume macroinvertebrates.
  b) p. 6-50 - Lake Thunderbird is generally a poor place for shorebirds, but is a good place for waterfowl most of which

14-3 The plan analyzed alternatives to deal with all levels of standards under consideration; the preferred action is capable of expansion to advanced treatment, if necessary. There have been recent changes regarding the standards; see response to Issue 5, Part II, Section C of the Final EIS (pp. II-16 to II-17).

14-4 See Part II, Section C of the Final EIS, response to Issue 3 (p. II-15).

14-5 See Part II, Section C of the Final EIS, response to Issue 6a (p. II-17). The chemical sludge/ash disposal site shown on Figure 5-5 would be needed only if the codisposal alternative were chosen for sludge disposal, or if wastewater treatment to level D were required, neither of which would occur under the action proposed at present.

14-6 See Part III, Section A of the Final EIS, Errata for pages 6-50 and 6-51 (p. III-2).

14

14-6 feed on benthic vegetation.
c) p. 6-51 - The comment on Bald Eagles is anecdotal and trivial. In recent years, Bald Eagles have been observed at Lake Thunderbird every winter (perhaps as many as 5-10 individuals in some years).

14-7 d) p. 6-53, 3rd complete par. - No flow does not mean no water. At the worst I have seen the River, some pools were present in the river bed, and the tributaries (which are slightly lower than the river at their mouths) contain water which act as refugia for aquatic river life. It is false to consider that river-living organisms require waste water flows to maintain themselves. In fact, wastewater poses the greatest threat to aquatic river life at low-flow periods; not only do these periods occur during the late summer when thermal stress is severe, but additional stress would be created by the phosphorus-algae bloom-raised water temperature links agitated by even relatively clean waste water.

14-8 3) CRPA recommends any right of ways or interceptors avoid Oliver Wildlife Preserve in accordance with Carpenter (on p. 6-51).

14-9 4) Note that much of the Canadian River floodplain is covered by aeolian deposits of sand. Thus any disposal on these soils (sands) must consider the high probability of lateral movement and potential for mixing with river water also moving laterally through the sands.

14-10 5) Canadian River and South Canadian River are used interchangeably. Canadian River is correct and is the name employed by the U.S. Geologic Service on their topographic maps.

14-11 6) The reproduction of the maps was poor on my copy. This should be corrected.

We hope our comments prove useful and will receive consideration in the Final EIS. The document will undoubtedly be used often in the future. We would appreciate receiving a final copy.

Sincerely,

Joseph A. Grzybowski
Vice President
Canadian River Park Association, Inc.
823 North Berry
Norman, OK 73069

14-7	The procedures for setting stream standards are intended to take low-flow problems into account, including stresses related to algal blooms resulting from phosphorus discharges. See Part II, Section C of the Final EIS, response to Issue 5 (pp. II-16 to II-17).
14-8	See Part II, Section C of the Final EIS, response to Issue 6b (p. II-17).
14-9	No sludge disposal onto floodplain soils will occur under the proposed alternative.
14-10	The correct name is the Canadian River. The terminology in the EIS reflects general usage among the public, which represents one of the major audiences for the EIS.
14-11	Selected maps have been reprinted in Part III, Section B of this Final EIS (pp. III-7 and III-23 to III-25).

15

September 11, 1982

Mr. Clinton B. Spotts, Regional EIS Coordinator
U. S. Environmental Protection Agency, Region 6
1201 Elm Street
Dallas, Texas 75270

RECEIVED
SEP 13 1982
6 ES

Re: Draft Environmental Impact Statement
Wastewater Treatment Facilities
Norman, Oklahoma

Dear Mr. Spotts:

The members of Careing (Citizens Association for Responsibility and Equity in Norman Government) are very concerned about the proposed lift station D illustrated on Page 5-11 of the EIS Draft.

15 See Part II, Section C of the Final EIS, response to Issue 2 (pp. II-14 to II-15).

Careing is opposed to developing 460 acres with sewer service when we have no water supply with water lines or wells within the area. This area is three or four miles from the water treatment plant and we have a high cost of pumping and treating enough water for 4,500 people. And too this is in the Little River flood plane, on prime agricultural land. This development would add 2% phosphorus to Lake Thunderbird.

We feel a cost effective manner would be to form a loop from the existing Woodcrest to lift station E, which is 399 acres, established residential and business, and would add only .6% phosphorus and it would loop into the Bishop Creek line as proposed in the 1985 General Plan.

A sewer line from the Crystal Heights lift station to the Woodcrest lift station, then east and south to connect to the lift station E and line E-1 would be delivered to a part of the Bishop Creek interceptor system to form a loop and appears more cost effective and efficient in performance. This area is around the water treatment plant.

We were put in a situation like this when all the development in Norman was forced to the west side because a moratorium was imposed on the East side of town. We did not have a water distribution system for that area to accomodate several hundred acres of development and the cost was $12 million in a bond package. We do not want that again. We feel our recommendation would be good and avoid a leapfrog development.

Sincerely,

Jo Juan Saults

Jo Juan Saults, Secretary
Careing

16

September 11, 1982

Clinton B. Spotts, Regional EIS Coordinator
U.S. Environmental Protection Agency, Region 6
1201 Elm Street
Dallas, Texas 75270

Subject: Comments relative to Draft Environmental Impact Statement Wastewater Treatment Facilities, Norman, Oklahoma.

1. At the September 2 public hearing held in Norman, Oklahoma relative to above subject, the moderator commented to the effect that the City of Norman was going to procede with the expansion of wastewater treatment system without EPA. Presumably this was in reference to correcting the Bishop Creek drainage system. The EIS report makes reference to the percentages of funds that might be available to the City of Norman for the various projects: correct current collector system, expansion of the collector system and the improvement of the wastewater treatment plant.

16-1 On page 4.7 reference is made to the possibility that the City of Norman could apply for grant money for the Bishop Creek drainage improvements in the amount of $2,025,639. This is after the fact--the taxpayers of this city approved a bond issue for the improvements and the ad valorum taxpayers are currently financing the project 100%. If $2 million plus materializes in grant money towards the Bishop Creek project, will the local ad valorum taxpayers be refunded for thier contribution towards the project? This definitedly appears as a refund that belongs to the ad valorum taxpayers and not to the elected and nonelected officals of the city to do with as they please.

16-1 See response to Issue 4, presented in Part II, Section C of the Final EIS (pp. II-15 to II-16).

16-2 2. A drinking water reservoir--Lake Thunderbird should never have been built to serve so many purposes. But, the lake exists now! The preservation of the lake as a water supply should be top priority and other uses should be phased out. I'm concerned about Lake Thunderbird being further contaminated at the same time the local taxpayers are paying an additional penny sales tax (even on food) to make the debt payment on bonds to expand the water treatment plant and water distribution system to utilize the 14,000,000 gals of water/day allocated to the City of Norman from Lake Thunderbird.

16-2 See Part II, Section C of the Final EIS, response to Issue 1 (pp. II-9 to II-14).

16

p.2

16-2 It is a vicious cycle, spend taxpayers' dollars to build the reservoir, to purify and distribute the drinking water and then turn around and ask the taxpayers to spend more tax dollars to further contaminate the drinking water, by making it easier to urbanize the Little River Basin. The next slot in the cycle will be to ask the taxpayers to spend more tax dollars to save the lake from further contamination and/or clean up the contamination.

16-3 The COMPLAN is not that old and as of Sept. 7, 1982 there have been over 20 requests to amend the plan, in addition to two amendments that has changed Urban Reserve Land, Tier III to Tier II land. To solve the sewer problem for one of these land changes, a sewer line designated to serve another area will be tapped into. The COMPLAN in my opinion will not serve the purpose your report implies, protection of the Little River Basin area or controlling growth into designated areas.

16-4 3. On page 4-5 of EIS report. "Summary. The primary focus on the Norman facilities plan is to solve existing problems in the collection and treatment system, and to provide additional capacity for the year 2000." On page 5-22 reference is made to 14.7 miles of new sewer lines. How many of these lines are to serve existing urbanized areas and how many miles will serve undeveloped areas, thus opening areas to urbanization? Who pays for what and how many times?

Current residents have been paying for the existing wastewater treatment plant that was designed and built to treat wastewater for a population of 100,000 people (Sept. 2 public hearing). Now some more additional dollars are needed to bring the plant up to that capacity and selected standard. Let's stop pumping wastewater 10 to 15 miles for treatment. There are methods of treating wastewater within small areas, e.g. 1 square mile, in which the wastewater is treated at a central point and the treated water is recycled within the same area. If this method were used for undeveloped square miles or unsewered areas, the residents within the square mile would bear the cost of treating their own wastewater and also have the use of the treated water. Thus growth would pay for itself, rather than existing residents continuously picking up the tab for longer and longer transmission lines, more lift stations and bigger and bigger sewage treatment plants that don't work like their designers claimed they would. This type of system would also eliminate planning for line sizes for a specific growth for the year 2000. Planning lines for a specific growth in 2000, just means the planning and digging starts all over again in 2000. It appears that government planning doesn't necessarily solve problems, but certainly continuously creates them.

16-3 See Part II, Section C of the Final EIS, response to Issue 1h (p. II-13).

16-4 Detailed information on the location, purpose and cost of each proposed line is provided in section 5.2.2 of the Draft EIS; see especially figures 5-3 and 5-4 and Table 5-1. Table 5-1 details the portion of sewer construction costs which the facilities plan engineer believed were potentially eligible for EPA funding. See also Part II, Section C of the Final EIS, response to Issue 4 (p. II-15 to II-16).

With the possible exception of lines C-1 and C-2 (Bishop Creek Interceptor), all of the linework proposed by the city of Norman is considered not eligible at this this time. EPA cannot participate in funding for linework which will provide only for future growth. Costs for linework constructed for future development must be borne by other entities. One of the reasons for not funding interceptors into undeveloped and sparsely developed areas is that it may not be cost-effective to do so. A municipality may encourage the construction of small systems to handle such development. However, experience nationwide indicates that centralized treatment systems are usually more cost-effective and reliable than numerous independent systems. In any case, EPA requires that interceptors be shown to be less costly than small systems before funding can be provided.

16

16-5 4. If this project proceeds based on reports, then it should be divided into at least three parts for step-wise financing, such that the taxpayers of the community (whether it is federal, state or local tax dollars) who must foot the bill can make a decision based on immediate needs. This would leave the expansion of the system to accommodate growth as a separate issue. The three parts proposed for step-wise financing are:

1. The existing collector lines should be improved before any other projects are funded.

2. The wastewater treatment plant improved to meet the discharge standard selected.

3. The expansion of interceptor lines to serve undeveloped areas. Funding for this should be such that the developers and the residents that move into these areas pay the costs. This to me could be best served by self-contained systems for areas of 1 square mile.

16-6 5. Funding is continuously mentioned throughout the report; grants; increase in sewer rates; increased sales tax and ad valorum tax increases. To me there are essential two basic costs associated with a wastewater treatment facilities: construction (presumably and hopefully a one time cost) and maintainance-operational costs--an on going cost. Will a sewer rate increase to $15 cover both these costs? If it covers only one cost, which one and when would that rate go into effect?

16-7 6. In conclusion I would comment on or question several other items. There are two Canadian Rivers in the State of Oklahoma and Norman is in the South Canadian River basin. Either the full name "South Canadian River" should be used throughout the reports or reference made in the beginning of the reports that whenever Canadian River is used, it is referring to the South Canadian River.

16-8 How are waste chemicals disposed of in the various departments of the University of Oklahoma, Norman Municipal Hospital and Griffin Memorial Hospital? If the chemical are disposed into the wastewater system of the City of Norman, is the treatment of these waste chemicals creating additional problems at the wastewater treatment plant? If so, what problems and how are they being solved?

16-9 What effect will the Oklahoma City selection of South May and 148th Street for its new sewage treatment plant have on water flow in the South Canadian River?

Reproduced from
best available copy.

Sylvia G. Martin

Sylvia G. Martin
P. O. Box 2350
Norman, Okla. 73070

16-5 Treatment plant improvements must be a high priority because the city is not in compliance with its NPDES permit. Otherwise priorities are as expressed by this comment. See the response to comment 16-4.

16-6 The estimate of $15 covers both capital and O&M costs; note that the cost is projected to be less if EPA funding is received. See Part III, Section A, Errata for page 5-49 (p. III-1).

16-7 The correct name is the Canadian River. See response to comment 14-10.

16-8 Special handling and disposal of hazardous wastes are provided by each of these institutions; such wastes are not put into the Norman wastewater system. An industrial wastewater sampling program was conducted by the facilities plan engineers. The results of the sampling are given in Appendix 13 of the facilities plan; no levels of toxics which would affect wastewater treatment were noted in the results. Norman is in the process of developing an industrial pretreatment program. This will include an ordinance regulating industrial discharges, monitoring of industrial wastewater, and enforcement against industries which do discharge pollutants in quantities sufficient to impair wastewater treatment.

16-9 The new treatment plant will replace the existing Greenbriar plant, Will Rogers treatment plant, and Will Rogers lagoon, all of which discharge to tributaries of the South Canadian River. The combined discharge of these treatment facilities is currently about 3.5 mgd, which will be the initial discharge of the new plant. The design capacity of the new treatment plant is 6 mgd. ACOG modeling indicates that the increase in flow will have no significant impact over existing flows (Tony Mayne, Personal Communication, Association of Central Oklahoma Governments, Oklahoma City, February, 1983). Note that during much of the year the Canadian River is dry within a few miles downstream of a discharge; the discharges from Oklahoma City have little or no impact on the river at Norman.

17

Norman, Oklahoma
September 11, 1982

Mr. Clinton B. Spotts, Regional EIS Coordinator
U. S. Environmental Protection Agency, Region 6
1201 Elm Street
Dallas, Texas 75270

RECEIVED
SEP 13 1982
6 ES

Re: Draft Environmental Impact Statement
Wastewater Treatment Facilities
Norman, Oklahoma

Dear Mr. Spotts:

Due to higher level of phosphorus into Lake Thunderbird from the proposed building of lift station D illustrated on page 5-11 of the EIS Draft, we are definately against it. There are no water wells, or no water lines going to the proposed area which is 460 acres of prime agricultural land and is in the Little River flood plane.

We feel it more feasible to loop the sewer from the existing Woodcrest to lift station E, since it is established residential and business, and would add only .6% phosphorus to the lake and this would lo op into the Bishop Creek line as General Plan 1985 proposed. This area is around the water treatment plant already.

We certainly are not in favor of another big bond package as was put on Norman residents after the west side developed and lines were put in for them.

We hope you will consider our recommendation, or at least study another less costly plan.

Very truly yours,

Gene & Jo Juan Saults

Gene and Jo Juan Saults

17 See Part II, Section C of the Final EIS, response to Issue 2 (pp. II-14 to II-15).

18

RECEIVED
SEP 13 1982
6 ES

September 8, 1982

Mr. Clinton B. Spotts, Regional EIS Coordinator
U.S. Environmental Protection Agency, Region 6
1201 Elm Street
Dallas, Texas 75270

Re: Draft Environmental Impact Statement
Wastewater Treatment Facilities
Norman, Oklahoma

Dear Mr. Spotts:

I am extremely concerned about the proposed lift station D illustrated on page 5-11 of the EIS Draft. 18

18 See Part II, Section C of the Final EIS, response to Issue 2 (pp. II-14 to II-15).

This is in the Little River flood plane, on prime agricultural land, and at present Norman has no water distribution lines in this area. Development in this area would add 2% phosphorus to the Lake Thunderbird. There are two lines, one from Woodcrest and another from the Crystal heights area which would be very expensive.

A sewer line from the Crystal Heights lift station to the Woodcrest lift station, then East and South to connect to the lift station E and line E-1 would be delivered to a part of the Bishop Creek interceptor system to form a loop appears to be more cost effective and efficient in performance.

The water treatment plant is in this area so we have a water system.

The drainage area here would add only .6% phosphorus to the runoff to Lake Thunderbird and we would not use prime agricultural lands.

We were put in a situation like this when all the development in Norman was forced to the West side because a moratorium was imposed on the East side of town. We did not have a water distribution system for that area to accomodate several hundred acres of development and the cost was a $12 million bond pagkage. We do not want that again.

The sewer lines should go first where the water supply system is.

Sincerely,

Larry D. Duncan

APPENDIX B. PUBLIC PARTICIPATION EVALUATION

a design for living

THE CITY OF
NORMAN, OKLAHOMA
POST OFFICE BOX 370 73070

OFFICE OF CITY COUNCILMEMBERS
405/321-1600

April 28, 1983

David A. Rennie, Director of Pubic Works
City of Norman
P. O. Box 370
Norman, Oklahoma 73070

Dear Mr. Rennie:

It has been a pleasure to serve on behalf of the City Council as a member of this Citizens Advisory Committee to provide public input in the development of the Environmental Impact Statement for the City of Norman Facility Plan. The purpose of our committee was to digest the information and preliminary work of the Environmental Consultant Lee Wilson and Associates, Inc., of Santa Fe, New Mexico, and evaluate the community opinions. In this manner, public opinion would be available to the consultants during the preparation of the document which would make the final document more representative of the community viewpoints as well as the technical aspects of the environmental impacts of the actions proposed by the Facility Plan. The viewpoint of the individual committee members does not reflect the overall community viewpoint, but the consensus of the committee generally does reflect the community viewpoints because of the diversity of interest of the individual members.

This project has been a long time in getting to the point of a final document, although the most active work of the committee was only a portion of this time. The consensus opinions of the committee were given to Lee Wilson and Associates, Inc., as well as any minority opinions which were significantly different from the group. It was felt that Lee Wilson and Associates, Inc., was made aware of all opinions of the committee and given direction as to the overall consensus of the members of the committee.

THE UNIVERSITY CITY

APPENDIX B. PUBLIC PARTICIPATION EVALUATION

Mr. Rennie
April 28, 1983
Page 2

The committee work overall was very educational and revealing as to the problems facing our community with regard to sanitary sewer facilities. Concern for the Little River Watershed, the balance between community growth and problems with the existing systems, options and selection of treatment processes, and other topics of the Environmental Impact Statement made very interesting subjects of discussions.

The committee wishes to extend its appreciation to Lee Wilson for his preparation of the Little River Report. This report, requested by the committee, addressed problems within the Little River Watershed which could not be addressed by an EIS concerning generally the urban area within the City.

In summary, it is felt that the committee was able to accomplish its purpose to provide Lee Wilson and Associates, Inc., with the general community viewpoint of the topics contained within the EIS. Additionally, all minority viewpoints were given to him for evaluation. It is felt that the Environmental Impact Statement does reflect these community viewpoints and addresses all sides of the issues.

I have enjoyed working as a member of this committee and am sure the other committee members feel the same. I'm anxious to see the City of Norman proceed with the improvements outlined in these documents for the betterment of the community.

Sincerely,

James H. Davis

James H. Davis, Cmdr, USN(Ret)
Chairman
Environmental Impact Statement
Citizens Advisory Committee

JHD/db
cc: James D. Crosby, City Manager
John W. Baxter, City Engineer
Presley Hatcher, EPA
Lee Wilson and Associates, Inc.
EIS Committee Members